Economic Growth in Asia

Steven Radelet
Harvard Institute for International Development

Jeffrey Sachs
Harvard Institute for International Development

Jong-Wha Lee
Korea University and Harvard Institute for International Development

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Abstract

This paper analyzes Asia's dramatic economic growth during the past thirty years and explores the prospects for continued growth during the next thirty years. The paper, which was written as a technical background paper for the Asian Development Bank's *Emerging Asia: Changes and Challenges* study, covers a wide range of topics, including the determinants of economic growth across countries, the relationship between manufactured exports and economic growth, the determinants of savings rates, the role of governance in East Asia's rapid growth, and economic outlook for Asia's future.

Asia's episode of rapid economic growth since the 1960s, as remarkable as it was by historical standards, can be explained in an international comparative context. Special theories of Asian growth are not necessary. East Asian countries grew faster than the rest of the world for four key reasons: they had substantial potential for catching up (since the entered the 1960s with relatively low incomes and relatively well-educated workers), their geographical and structural characteristics were by-and-large favorable, demographic changes following World War II worked in favor of more rapid growth, and their economic policies and strategy were conducive to sustained growth. Most importantly, the high-performing East Asian countries recognized the imperative of joining the world economy through the promotion of labor-intensive manufactured exports. They promoted exports through a combination of policies -- relatively free trade, convertible currencies, macroeconomic stability -- and through a set of innovative institutions -- such as export processing zones, duty exemption schemes, and incentive packages for foreign direct investment.

These findings have profound implications for the next thirty years. For the fast-growing countries of East Asia, there is a continuing opportunity for rapid growth, though at rates that are likely to be somewhat slower than in the past, precisely because the process of catching up has been so successful to date. Yet future growth will require successful institutional adaptations to new challenges, including: an aging population; increasing urbanization and political participation; and pressures related to increasing integration of the world economy. As a result, these countries will face increased stresses on public-sector budgets, pressures for continued reforms of the legal system, and the need for flexibility and adjustment of political institutions. For countries that grew more slowly during the past thirty years, the main message is that faster growth is possible, and indeed likely, as these countries adopt market-based strategies and increased openness to world markets. South Asia has the opportunity for the kind of dynamism displayed previously in East Asia. However, such good performance will depend on continued institutional and policy reforms in trade, the budget, health and education. Our calculations suggest that under reasonable assumptions, Asia's share in world GDP could well grow to more than half of the world economy from its current level of about 35% during the next thirty years.

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East Asia's rapid economic growth continues to fuel an intense debate among economists and policymakers. Is the rapid growth the result of a unique model of economic development? Can East Asia's experience be emulated by other developing countries, including the slower growing countries of Asia? Will the rapid growth continue? Will Asian growth succumb to increasing strains due to economic maturation, rising income inequality, global protectionism, increased competition from other developing nations, adverse shifts in global demand, or other forces that could undermine the dynamism of recent decades?

This paper addresses these critical questions by placing Asia's growth experience in a broad historical and international perspective. We proceed by addressing three basic questions. First, is East Asia's growth record explicable in terms of broad international patterns of growth, or is there something unique about the East Asian experience that is inexplicable according to international patterns? Our basic answer is that East Asia's growth record can indeed be understood according to the patterns of global growth. Second, are the factors that propelled East Asia to very rapid growth likely to continue in the future? Broadly, our answer is that rapid growth is likely to continue, though the rate of growth in the "Four Tigers" will be lower in the future as these economies narrow the income gap with the high income countries[1]. Third, can East Asia's rapid growth be emulated by other Asian countries, particularly the slower growing countries of South Asia? We believe that the East Asian record is broadly transferable to many other countries of Asia, and especially to the countries of South Asia. At the same time, we stress that parts of Asia have physical constraints that will limit their dynamism. For example, the mountainous, landlocked countries of Central Asia and the distant, lightly populated states of the Pacific Islands will have a difficult time generating the same success in export-led growth as the fast-growing East Asian economies.

There are also serious risks to our generally optimistic scenario. First, rapid growth has been based on a general orientation of economic policies that could be undermined by *domestic* political pressures within the Asian economies. For example, to the extent that rapid growth has benefitted from high rates of government saving, increased political pressures for government spending that may accompany urbanization and aging of the population could result in sharply falling saving rates and therefore sharply lower growth rates. Second, continuing rapid growth depends on a continued liberal trading environment in world markets. Protectionism in the advanced industrial countries, perhaps the result of increased trade tensions with low-wage Asia, could undermine one of the key bases of rapid growth. Third, it is at least conceivable (although we believe unlikely) that technological trends could undermine Asia's engine of export-led growth. Just as technological shifts have apparently worked against many primary commodity

[1] Throughout this paper, "East Asia" refers to the ten countries for which we have complete data in the region: the PRC, Hong Kong, Indonesia, Korea, Malaysia, Papua New Guinea, the Philippines, Singapore, Taipei,China, and Thailand. The "Four Tigers" include Hong Kong, Korea, Singapore, and Taipei,China. "Southeast Asia" refers to Indonesia, Malaysia, the Philippines, and Thailand; and "South Asia" includes Bangladesh, India, Pakistan, and Sri Lanka.

exporters in the past few decades, future technological shifts could reduce the growth dividends from labor-intensive exports in the future. If this occurs, then newcomers to export-led growth, such as India, might be unable to replicate the rapid growth experience of the previous generation of East Asian manufacturing exporters.

Our analysis proceeds as follows. In Section I, we discuss the results of a cross-country growth model that assesses East Asia's growth experience from an international perspective. We demonstrate that East Asian rapid growth, in particular, can be accounted for by a mix of initial conditions, economic policies, structural factors, and demographic change that have characterized the East Asian economies. In Section II, we examine the cross-country data to determine the dimensions of economic structure and policy in which Asia is truly distinctive relative to the rest of the developing world. By showing that East Asia's economic structure has been distinctive in four main areas -- greater openness to international trade, high saving and investment rates, prudent fiscal policies, and high average educational attainment -- we give added support to our conclusions concerning the sources of rapid growth in Asia. In Section III, we hone in on the role of manufacturing exporters in Asia's rapid growth. We show that during the past 25 years, rapid manufacturing growth has been a *sine qua non* of rapid overall GDP growth around the globe. Therefore, East Asia's distinctive channel of rapid growth has been its success in generating rapid export growth.

In Section IV, we examine the issue of high saving rates in East Asia. As in previous research, we are able to identify some sources of Asia's high saving rates, but other important aspects remain unexplained. It seems, however, that high saving has been a result of fast growth as well as a cause. Section V focuses on governance and economic leadership. Here we explore some of the factors that might explain why East Asian countries were better able to introduce sound economic policies and manage their economies than were their counterparts in other parts of the world. In Section VI, we address the debate over Asia's productivity performance. East Asia's TFP performance, in most cases, has been relatively strong compared with other developing countries, though not (in general) accounting for a predominant share of total growth. Most of Asia's growth can be accounted for by large increases in the stock of human and physical capital. There are good reasons to believe that even with the large amounts of factor accumulation that have already taken place in Asia, growth can be sustained. As we stress in this section, TFP is not, in any event, the most appropriate summary measure of a economy's capacity to grow, even in the long term.

Finally, in Section VII, we use the growth framework to make conditional projections of growth in the coming thirty years. Our main conclusion is that the Four Tigers will continue to grow, though at a diminished rate. China and the countries of Southeast Asia are likely to continue to grow rapidly, while South Asia is likely to experience an acceleration of per capita GDP growth. We also explore some of the big risks to future growth in Asia, looking both at the two largest economies -- China and India -- and at Asia's place in the global trading system.

I. Cross-Country Patterns of Economic Growth

The countries of East and Southeast Asia grew extremely rapidly during the last quarter century. The eight best performers -- Hong Kong, Singapore, Taiwan, Korea, China, Malaysia, Thailand, and Indonesia -- grew at an average of over 5.5% per year in per capita terms between 1965 and 1990. With the exception of several European countries in the immediate post World War II period, growth rates of this magnitude and duration are unprecedented in human history. But as remarkable as was the growth performance of these eight core economies, not all Asian developing countries were able to follow their lead. South Asia, the Philippines, Burma, Central Asia, and many of the Pacific Island nations all recorded average or below average growth in comparison with developing countries in other regions of the world.

In this section we explore the Asian growth patterns by quantifying the empirical relationships between long-term growth and various structural and policy variables. We base the analysis on a general framework of cross-country regression analysis that allows us to put the Asian experience in a global context. Our objective is to understand the critical dimensions in which the East Asian countries differed from other countries that allowed them to achieve rapid growth, and to explore the extent to which those dimensions are unique to these fast-growing economies.

Our approach does not identify all of the specific factors associated with economic growth across countries, nor does it in every case clarify the precise channels through which certain variables affect growth. Rather, it is an attempt to distill the vast amounts of information available on dozens of countries into a tractable, parsimonious framework that identifies a small set of variables that stand out as the most important factors influencing rates of growth around the world. This approach allows us to discern broad trends across countries that illuminate some of the key differences between fast and slow growing economies. Most importantly, this exercise provides strong clues to what lies ahead for Asian countries during the next thirty years. It provides a foundation to understand the likelihood of continued rapid growth in the "tiger" economies, as well as insights to the most appropriate steps that other countries in Asia can take to accelerate growth.

The Basic Growth Framework

The basic empirical framework is based on an extended version of the neoclassical growth model, as described by Barro (1991), Barro and Lee (1994), and Sachs and Warner (1995a and 1995b). This model predicts conditional convergence of income: a country with a low initial income relative to its own long-run (or steady-state) potential level of income will grow faster than a country that is already closer to its long-run potential level of income. The basic idea is that the farther an economy is located from its steady-state income level, the greater is the gap of reproducible (physical and human) capital and technical efficiency from their long-run levels. The gap of existing capital and technology from steady-state levels offers the chance for rapid "catching up," via high rates of capital accumulation as well as the diffusion of technology from

more technically advanced economies. Hence, the lower is the initial level of per capita income relative to steady state, the higher will tend to be the subsequent growth. This framework presumably helps to explain why wealthier countries, with relatively large capital stocks and already operating near the world's technological frontier, tend to grow more slowly than some lower-income countries that are catching up with the leaders.

If we could presume that all countries have the same steady-state income levels, then the neoclassical approach would imply, simply, that poorer countries would grow faster than richer countries. In fact, such a pattern is not generally observed. Over the period 1965-90, poorer countries did not, on average, narrow the income gap with the richer economies. The cross-country growth framework therefore builds in a crucial assumption, that countries have *distinctive* long-term levels of per capita income to which each is converging. Crucially, the long-term levels depend on two main kinds of variables: economic policies and economic structure. Countries with favorable economic policies (as identified below) tend to have a higher steady-state level of income, and therefore faster growth at any given initial level of income. Similarly, countries with a favorable economic structure (also identified below) tend to experience faster growth, on a path of convergence to a higher long-term level of income.

We should stress the precise meaning of "long-term" or "steady-state" as used in this analysis. In our interpretation, the steady state to which an economy is converging at any time t is conditional on the actual policies in place at time t. For example, an economy that is closed to international trade at time t is found to have a lower "steady-state" income level than an open economy. Strictly speaking, we are measuring the "steady state" on the assumption of *no future changes* in the explanatory (policy and structural) variables. If a closed economy subsequently opens to trade, then we interpret this as raising the steady-state level of income to which the country tends to converge.

The basic model is summarized in two equations:

(1) $\log(QL^i_t) = a + b\ Z^i_t$

(2) $d\log(Q^i_t)/dt = c\ [\log(QL^i_t) - \log(Q^i_t)]$

According to equation (1), the logarithm of the long-run steady-state level of output per worker in country i, denoted QL^i_t, is a function of a vector of variables Z^i_t, which includes both policy and structural variables as of time t. According to equation (2), the instantaneous proportionate growth rate of output per worker, $d\log(Q^i_t)/dt$, is proportional to the **gap** between the long-run level and the current level of output. By combining (1) and (2), we arrive at:

(3) $d\log(Q^i_t)/dt = a' + b'\ Z^i_t - c\ \log(Q^i_t)$ where $a' = ac$ and $b' = bc$

This equation describes current economic growth per worker as a function of structural and policy variables as well as current income. Of course, current output, all other things equal, has a

negative effect on growth: countries with higher output have less chance to "catch up" with their own potential. The next step in getting an estimated cross-country equation is to integrate the differential equation in (3) between time periods 0 (the initial year) and T (the final year). Simple manipulation of (3) gives:

(4) $(1/T)\log(Q^i_T/Q^i_0) = a'' + b''\,Za^i - c''\log(Q^i_t)$

where $a'' = a'(1-e^{-cT})$

$b'' = b'(1-e^{-cT})$

$Za^i = e^{cT}\int e^{-c\tau}\,Z^i(\tau)d\tau$

Note that Za^i is, essentially, an average value of Z^i during the period of observation. Note that in a growth equation estimated over the time period 0 to T, we use *initial income* at time 0 rather than average income during 0 to T, as the level of "current" income which determines the growth over the period of observation. Finally, consistent with most other growth studies, we would like to express the dependent variable as the growth in income per capita (rather than per worker). We note that:

(5) $Q^i_T/Q^i_0 = Y^i_T/Y^i_0 * N^i_T/N^i_0 * W^i_0/W^i_T$

where Y^i_T, N^i_T, and W^i_T denote per capita income, population, and labor force, respectively, in country i at time T. Substituting equation (5) into (4) and rearranging yields:

(6) $(1/T)\log(Y^i_T/Y^i_0) = a'' + b''\,Za^i - c''\log(Q^i_t) + (1/T)\log(W^i_T/W^i_0) - (1/T)\log(N^i_T/N^i_0)$

The two final terms in equation (6) are the instantaneous growth rate of the labor force and the total population, respectively. Equation (6) is the key equation for estimation.

A variety of policy and structural variables Z^i will affect growth rates by changing the long-run potential level of income. With regard to policy variables, considerable research and experience has shown that trade and financial policies, macroeconomic management, and maintenance of the rule of law (including property rights) all affect the climate for business activity, and thus the long-term potential level of income. Improving these policies increases the level of potential income, thus increasing the growth rate for any given initial level of income. With regard to structural variables, a country's geography, resource base, and ecology can affect long-term income levels. For example, the extent of endemic disease in the population -- which tends to be much higher in the tropics than in temperate climates -- can influence the long-term productivity of the labor force, and therefore the rate of growth at any given income level.

In order to account for cross-country difference in growth rates, we consider a wide variety of explanatory variables that have been proposed by earlier studies as important determinants of long-run income, and therefore current economic growth. We categorize these explanatory variables into four broad dimensions: (1) initial conditions (initial per capita GDP and

initial human capital stock); (2) natural resources and geography, including natural resource intensity, landlockedness, location in the tropics, and the ratio of coastline distance to land area; (3) policy variables (government savings, quality of institutions, and openness); and (4) demographic variables (growth of the working age population, growth of the total population, and initial life expectancy at birth). A summary of the variables, grouped by regions, is presented in Table 1.

Initial Conditions

In the basic framework, for given values of the other explanatory variables, the model predicts a negative relationship between initial income and subsequent growth -- that is, a country with a lower initial per capita GDP is in a more favorable position for future growth. It is well-known that, without controlling for other factors, poor countries do not generally grow faster than rich countries. However, a considerable body of empirical evidence has shown that once important structural and policy variables are taken into account, poor countries indeed grow faster than rich countries. (Sachs & Warner, 1995a; Barro and Lee, 1994; Mankiw, Romer, and Weil, 1992; Barro and Sala-i-Martin, 1992, Barro, 1991). This outcome has become known as conditional convergence.

Sachs and Warner (1995a), for example, found that poor but open economies tend to grow faster than rich open countries. Countries that isolate themselves from the global economy are in a much weaker position to take advantage of new technologies, or to develop as extensive a division of labor, and therefore show less tendency to catch up. Figure 1 shows the basic relationship between the initial level of income and the subsequent rate of economic growth for the group of thirty countries that have been most open to the global economy during the last 25 years (specifically, where the Sachs/Warner openness variable has a value of 0.8 or higher, on a scale of 0-1, with 1 being the most open). In this set of open countries, the poorest countries exhibit the highest growth rates, and the richer countries record slower growth rates. In all but one of these open economies, the level of income relative to the U.S. in 1990 was higher than it was in 1965 (see Table 2). Switzerland, the one exception, was the country closest to the U.S. average in 1965, and thus the one with the weakest tendency towards further catching up.

The tendency for poor countries to grow faster than rich countries has two important implications in the Asian context. First, it provides one piece to the puzzle of explaining East Asia's rapid growth during the last thirty years. Low levels of income in the 1960s provided the *potential* for rapid growth. Importantly, this reasoning also implies that some of the other, slow-growing Asian countries have the capacity for more rapid growth in the future. Second, as East Asian countries become wealthier, their growth rates are likely to slow. Japan is a clear example of this pattern; its expansion slowed considerably during the 1980s as it narrowed the gap in per capita income with Europe and the United States (Figure 2). When income per capita in Japan was less than 50% of the U.S. average in the 1960s, annual growth exceeded 9%. By the time Japan had reached 70% of U.S. income, its annual growth rate had slowed to 4%, and now that its income is about 90% of the U.S. level, its growth rate is closer to 2%.

The data on 1965 income in Table 1 indicate that all three groups of Asian countries were well placed for rapid growth, based on their relatively low levels of income. But obviously there is more to the story -- sub-Saharan Africa and South Asia had the lowest initial income levels, and therefore had the potential, all other things equal, to grow more rapidly than the East Asian countries. Clearly, differences in long-term potential income, as conditioned by policies, structure, and demography, have played a role in the differences in growth within Asia and between East Asia and the rest of the world.

Human capital, measured in terms of levels of education and health, is often suggested as a possible source of growth. A better educated, more skilled workforce is likely to be able to produce more from a given resource base than less-skilled workers. Following Barro and Lee (1996), we use the average years of secondary schooling for the working-age population at the start of the period of observation (1965) as our primary measure of the initial skill level of the population (we explore several other measures as well). The Four Tigers' average of 1.5 years of secondary schooling was the highest of the developing country regions in our sample.

Natural Resources and Geography

We examine four kinds of structural variables that may represent natural barriers to economic growth. The first variable measures natural resource abundance, and is calculated as the ratio of primary-product exports to GDP in 1971 (the earliest year in which data are available for all countries). Sachs and Warner (1995b) observe that natural resource-abundant economies have tended to grow *more slowly* than resource-rich economies during the past twenty years. For example, countries with primary product exports valued at between 0 and 5 percent of GDP recorded growth per person of over 3.2 percent between 1965 and 1990, whereas countries with primary product exports equivalent to over 20 percent of GDP grew just 0.8 percent per person per year (see Figure 3). This pattern continues to hold once other variables, including initial income, geography, government policies, are taken into account. We note here that the Four Tigers recorded primary exports equivalent to an average of just 1 percent of GDP in 1971, far less than the average for other regions.[2]

The reasons for this negative relationship remain unclear. After all, natural resource exports can provide foreign exchange earnings and finance investments in infrastructure, health, and education. Indonesia and Malaysia are examples of how governments can use the revenues earned from natural resource exports to boost incomes and improve welfare. During the last century, exports of natural resources also played a critical role in supporting sustained growth and development in several countries, including the United States and Argentina.

Over the last thirty years, however, many countries with abundant natural resources have performed poorly. In Mexico, Venezuela, Nigeria, Zambia, and a host of other countries, the

[2] For Singapore, natural resource abundance is measured as primary exports minus primary imports as a percentage of GDP, to account for Singapore's imports of petroleum products and exports of refined petroleum.

initial fillip to income from natural resource exports was followed by long periods of stagnation or even decline. There are several possible explanations for this poor performance. One hypothesis is that natural resource abundance produces a "Dutch Disease" phenomenon, in which a strong resource base causes an appreciation of the real exchange rate, and thereby renders unprofitable an export-oriented or import-competing manufacturing sector. In this way, the natural resource abundant economies may have found themselves priced out of world markets in the production of labor-intensive goods -- such as apparel, footwear, toys, and electronics assembly -- which have been the first steps on the ladder towards rapid industrialization in East Asia. This impoverishment of resources may have contributed to their success by forcing the NICs to compete in manufactured exports. We also note, however, that South Asia, the region with the next smallest share of primary exports, achieved much less success in manufactured exports than in the Four Tigers, while much of Southeast Asia has recorded rapid growth in manufactured exports despite the relative natural resource abundance in Malaysia, Indonesia, and the Philippines.

Another possible reason why we observe slower growth in resource abundant economies is that profitable investments in the resource sector itself tend to be limited in scope, so that after the resource sector is developed, it usually does not generate continuing marked improvements in technology and job growth. Workers in resource abundant economies may initially receive higher wages, but without the impetus to productivity gains that comes from competing on world markets for manufactured goods, wages tend to stagnate, a pattern observed in recent decades in resource-based Latin American economies.

In addition, resource-abundant economies may provide greater opportunity and incentive for rent seeking and corruption, particularly if the resources are government owned, or heavily taxed. In these situations, entrepreneurial energies are likely to be focused on obtaining a larger piece of the existing economic pie, rather than on efforts to enlarge the pie. Additionally, resource abundant countries tend to follow boom-and-bust cycles in line with sharply fluctuating prices of their export commodities. Export receipts and government revenues are subject to sharp increases and declines, complicating macroeconomic management, creating uncertainty, and undermining long-term investment.

Finally, long-term structural trends in commodity markets may have put primary producers at a disadvantage. Raul Prebisch (1950, 1959) argued long ago that secular declines in commodity prices would doom the exporters of primary products to slow growth. Ragnar Nurske (1961) concluded that because of technological innovations, world demand for primary products would grow slowly at best. Although there is much debate on these trends, the evidence appears to support both a gradual decline in commodity prices and slower growth in demand for primary products, especially since 1970[3].

The second structural variable we examine is access to the sea, as indicated by whether or

[3] For summaries of these studies, see Sapsford and Balasubramanyam (1994) and Balassa (1989).

not a country is landlocked. Landlocked countries have enormous cost and risk disadvantages that they must overcome to compete on world markets. Shipping costs for all imported goods are much higher, as landlocked countries must pay for transport by road and rail, as well as the costs associated with crossing at least one additional international border. The cost of extra shipping is magnified by the uncertainty of inland road conditions and customs clearance, which lead to higher insurance costs for each shipment. Their only alternative is to ship by air, which can be prohibitively expensive for many goods. Thus, it is much more difficult for manufacturing firms located in landlocked countries such as Nepal, Mongolia, Uzbekistan, Kazakhstan, and the Kyrgyz Republic to be competitive in world markets, unless they are processing domestic natural resources.

A third, and closely related structural variable is the ratio of a country's coastline distance to its total land area. This indicator gives a rough measure of the share of the population with relatively easy access to the sea. In countries where this ratio is relatively high (such as island economies), a larger share of the population is likely to be engaged in activities grounded in international trade. Adam Smith, who pointed out in *The Wealth of Nations* the difficulties facing landlocked countries, also discussed the importance of access to the sea *within* countries. He predicted that an extensive division of labor would develop mainly where sea-based trade was feasible. "[S]o it is upon the sea-coast, and along the banks of navigable rivers, that industry of every kind naturally begins to sub-divide and improve itself, and it is frequently not till a long time after that those improvements extend themselves to the inland part of the country." China represents an excellent example of this phenomena, with basically all of its fast-growing economy activity located along the Southeast coastline, and little dynamism in its more inland regions. Smith's example was England, where he attributed the economy's relatively high productivity to, in part, its access to the sea. "England, on account of the natural fertility of the soil, of the great extent of the sea-coast in proportion to that of the whole country, and of the many navigable rivers which run through it, and afford the conveniency of water carriage to some of the most inland parts of it, is perhaps as well fitted by nature as any large country in Europe, to be the seat of foreign commerce, of manufactures for distant sale, and of all of the improvements which these can occasion." Our variable, the ratio of coastline distance to total land area, is Smith's suggested specification. In the terminology of the neoclassical model, we expect higher values of this indicator to be associated with higher steady state levels of GDP, and therefore higher growth rates. The Four Tigers' ratio of coastline to land area was by far the highest of any region in the world, with Southeast Asia's the second highest.

Our fourth structural variable is location in the tropics. Very few countries located in the tropics have achieved sustained economic success. Tropical countries face several important disadvantages. The prevalence and burden of infectious diseases in much higher in the tropics than in more temperate climates. Malaria, schistosomiasis, and many other debilitating maladies are most prominent in tropic climates. These diseases reduce worker productivity and add to the cost of health care. In additional, tropical agriculture is hindered by warmer temperatures and torrential rains (which tend to leech soils of important nutrients). There are some exceptions -- such as the richly fertile volcanic soils of Java -- but such cases are relatively rare. As a result of

these influences, tropical climates tend to support much lower population densities and thereby a less extensive division of labor than more temperate climates. Singapore and Hong Kong have been much less affected by their location in the tropics, probably because as city states, they have always had a relatively large share of manufacturing and small share of agriculture in GDP. The tropics are likely to have a far smaller deleterious impact on manufacturing firms in the tropics than on agriculture. In the closed space of a factory, air conditioning can compensate for hot, humid weather, putting tropical manufacturing on a par with factories in more temperate climes. This reasoning suggests the possibility of a tropical poverty trap. Agricultural-based economies will have great difficultly in generating sustained growth and affecting the transformation to a manufacturing-base economy. The few economies that are able to make the jump to manufacturing -- like Singapore and Hong Kong -- are in a much better position for rapid growth and catching-up with the world economic leaders.

Policy Variables

The first policy variable we consider is openness to international trade. Open countries have greater access to new technologies, larger markets, and improved management techniques. They also tend to have fewer distortions and better resource allocation, and their firms are more likely to be competitive on world markets. We use the openness measure constructed by Sachs and Warner (1995a). This index is the fraction of years between 1965 and 1990 that the country was considered to be open to trade. The judgement on the country's openness is made on the basis of four policy dimensions: (i) average tariff rates, (ii) extent of imports governed by quotas and licensing, (iii) average export taxes, and (iv) the size of the black market premium on the exchange rate. A country is considered to be open if it meets minimum criteria on all four aspects of trade policy: average tariffs must be lower than 40 percent; quotas and licensing must cover less than 40 percent of total imports; the black market premium must be less than 20 percent; and export taxes should be moderate.

Second, neoclassical growth theory suggests that an increase in the national saving rate will raise the growth rate associated with any level of income. However, as we discuss in more detail later in the chapter, there is a strong simultaneous relationship between aggregate saving and growth -- growth may influence saving as much or more than saving affects growth. The precise nature of the saving-growth relationship remains unclear. As an alternative, we explore the relationship between government saving (defined as the difference between current government revenues and current government expenditures) and economic growth. There are two distinct channels through which government budget policies are likely to influence growth. First, the more governments save, the more the nation as a whole saves (though the relationship is not one to one). This adds to the pool of finances available for investment. Second, higher government saving tends to be indicative of sounder overall macroeconomic management, including lower rates of inflation, prudent exchange rate policies, and capable monetary management. Stable economies, in turn, lower the risks for investors and therefore lower the cost of capital for long-term investments. Government savings in the Four Tigers were far higher than any other region of the world between 1965-90, averaging 5.6 percent of GDP, whereas

governments in the four Southeast Asian countries saved 3.5 percent of GDP. By comparison, government savings in South Asia averaged just 1 percent of GDP during the period.

A third policy indicator is a measure of the quality of public-sector institutions and their relationship to the functioning of markets. We use the index from Knack and Keefer (1995), which is based on data compiled in the International Country Risk Guide (1995). The overall index is itself an average of five indicators of the quality of public institutions, including: (i) the perceived efficiency of the government bureaucracy; (ii) the extent of governmental corruption; (iii) efficacy of the rule of law; (iv) the presence or absence of expropriation risk; and (v) the perceived risk of repudiation of contracts by the government. Each country is scored on these five dimensions on the basis of surveys of business attitudes within the countries. The sub-indexes on the five measures are then averaged to produce a single, overall index that is scaled between 0 and 10. The overall index therefore aims to measure the security of property and contractual rights, the efficiency of the government's intervention in markets, and the allocation of public goods. A lower index indicates poorer quality institutions, and thus higher investment risks and production costs. The Four Tigers' institutions score very high, registering 7.8 on a scale of 1 to 10. For all the other developing regions, the average index ranges between 4.3-4.9. Malaysia and Thailand both score above 6.0, and India records 5.8. The lowest institutional scores in Asia were recorded by Bangladesh (2.7), the Philippines (3.0), and Indonesia (3.7). These scores compare with an average score of 4.5 for both Latin American and sub-Saharan African countries included in the International Country Risk Guide data.

Demographic Variables

Economists have generally given scant attention to the relationship between demographic change and economic growth. Explorations of the role of demography are usually limited to aggregate population growth, which has yielded mixed results. In this paper, we explore the role of changes in the structure of the population, as well as its size, in economic growth. We do so by including the growth rates of both the working-age population (aged 15-64) and the total population in the growth equation.[4] For a given population growth rate, faster growth in the working-age population increases the size of the workforce, which should be positively related to output growth. At the same time, for a given growth rate of the working-age population, faster overall population growth implies an increase in the relative size of the dependent population. Therefore, the growth of GDP per capita is favored when the growth of the working-age population outpaces overall population growth; and GDP growth per capita is reduced in the opposite case, when population growth outpaces the growth of the working-age population.

Our basic growth specification in equation (6) stipulates a precise relationship between income growth, population growth, and labor force growth. It predicts that for a given population growth rate, a one percentage point increase in the growth rate of the labor force

[4] We are grateful to David Bloom and Jeffrey Williamson for suggesting this specification. See Bloom and Williamson (1997) for more discussion.

should lead to a one percentage point *increase* in the growth rate of per capita income. Similarly, for a given growth rate of the labor force, a one percentage point increase in the growth rate of the total population should lead to a one percentage point *decrease* in the growth rate of per capita income. In the four fast-growing East Asian economies, between 1965-90 the working age population grew one percentage point faster than the total population. In Southeast and South Asia, the differences were 0.55 and 0.25 percentage points, respectively. This suggests that the Four Tigers were given an important demographic boost which raised growth rates.

Our final demographic variable is Life Expectancy at Birth (LEB), measured in the initial year of the growth period. LEB can be viewed as a broad measure of the overall health of the population, encompassing the prevalence of disease and illness of the workforce. A higher life expectancy would tend to indicate a healthier, more productive workforce. LEB also measures changes in population structure, with a higher LEB associated with lower mortality rates and a longer life span for older workers and retirees. In the data, East Asia recorded a much higher level of life expectancy than the other developing countries in 1965. Life expectancy at birth was already 63 years in the Four Tigers in 1965, whereas it was only 49 years and 52 years, respectively in South and Southeast Asia. These lower levels presumably reflect both inherent geographic deficits (i.e. a tropic climate, prone to microparasitism) and lags in public health as of 1965.

Taken together, the data in Table 1 reveal stark differences across regions of developing countries. The Four Tigers recorded the most favorable conditions on every single variable, except for the initial level of income and location in the tropics. They were initially well endowed with human capital stock, measured by average years of secondary schooling (1.5 years). They had the *smallest* natural resource endowment, and therefore presumably the least Dutch disease pressures, and had the highest ratio of coastline distance to land area. The region recorded the most favorable stance on all three of the policy variables (openness, government saving, and quality of government institutions). It received the largest boost from the demographic composition of the population, and recorded the highest life expectancy at birth.

South Asia, by comparison, was disadvantaged by its lower levels of education and in particular by a relatively weak policy stance. The region scored particularly low on the openness index. Its demographic shift was much less favorable than East Asia's and it recorded a very low initial life expectancy, suggesting an environment particularly sensitive to microparasitism. Southeast Asia, by contrast, had a very favorable policy stance, especially on openness and the savings rate. These policies helped to compensate for average or below average initial conditions and structural characteristics. Sub-Saharan Africa has the most adverse natural conditions -- high transportation cost, high natural resource intensity, and high disease endemicity (as proxied by LEB) -- and it was further disadvantaged by below average scores on each of the policy variables. It also recorded the smallest difference between the growth of the working age population and the total population. Latin America is close to the average on most of the variables, but was well below the mean for both openness and institutional quality, suggesting that policy deficiencies are the main source of Latin America's poor growth performance in recent decades.

Regression Results

In Table 3a, we present the results of our regression estimates, using the framework of equation (6) and the explanatory variables just described. The dependent variable is the annual growth rate of real GDP per capita between 1965-90, as measured by the Penn World Tables, version 5.6.[5] The regressions apply to a data set for 78 countries, including all countries for which we could obtain a complete data set for all variables. Column (1) of Table 3a shows the results of the basic regression.

Basic Results

The results shows strong evidence for conditional convergence. For the basic set of results in column 1, the coefficient on the log value of initial GDP is highly significant, and the estimated coefficient is -1.98 (t = -9.42). Countries with lower incomes in 1965 grew faster than countries that began with higher incomes, after controlling for the other variables that influence the steady-state level of income. Specifically, a country at half the income level of another country tends to grow by 1.4 percentage points (= 1.98 x ln(2)) faster than the richer country, assuming the same level of long-term income. Much of the variation in cross-country growth is the result of poorer countries catching up with richer countries. For example, since average income in the Four Tigers was one-sixth the U.S. level in 1965, the catch-up factor boosted their growth rates by 3.5 percentage points a year relative to the U.S. between 1965 and 1990.

The estimated coefficient on the initial educational attainment variable (the log value of mean years of secondary schooling) is positive, but is not statistically significant. This result is consistent with other studies that have found a weak direct link between education and growth. One possible explanation is measurement problems. For example, available data do not make any adjustment for the quality of schooling, which arguably is a key determinant of human capital accumulation. It is also possible that low levels of schooling in 1965 implied faster increases in schooling after 1965, and therefore a faster improvement in human capital in the subsequent 25 years.

The estimated coefficient for the natural resource abundance variable is -2.43 (t=-2.36), indicating that during the period 1965-90, countries with abundant natural resources grew more slowly than other countries. This result is consistent with that of Sachs and Warner (1995). The finding suggests that one reason the Four Tigers grew rapidly was that they were resource poor, which may have induced them to turn to manufacturing more quickly and vigorously than other countries. Of course, there were exceptions to the general correlation of natural resource abundance and slow growth: resource-poor India grew slowly while resource-rich Malaysia and Indonesia both recorded strong growth rates. The negative relationship between resource abundance and growth is a tendency, not a straightjacket. Natural resource abundance is not

[5] The PPP-adjusted income data from the Penn World Tables for China differ widely form other sources. Therefore, we used the growth rate data in Gang, Perkins, and Sabin (1997).

necessarily an impediment to growth, but it creates challenges in economic management with which many countries have had difficulty coping. As a result, resource abundant countries have tended to grow more slowly than others.

The regression results confirm our hypotheses about geography: countries that were landlocked, or whose populations had relatively little access to the sea, or that were located in the tropics all recorded lower growth rates between 1965-90. Landlocked countries grew on average six-tenths of a percentage point more slowly than other countries between 1965 and 1990, accounting for a cumulative 14 percent lower level of income by the end of the period. Similarly, countries with less coastline relative to their total area grew significantly more slowly than other countries, after controlling for other variables.

Location in the tropics had a very strong, negative impact on growth. We find that countries located in the tropics grew 1.26 (t=-4.29) percentage points slower than countries located in more temperate zones. These results, together with the estimated coefficient on initial income, imply that the long-run level of income in countries in the tropics is only 53% ($1/e^{(1.26/1.98)}$) of the long-run level for countries outside of the tropics. Only eight countries in the tropics (out of sixty tropical countries for which we have data) recorded growth rates in per capita GDP in excess of 3 percent between 1965-90. Five were in East Asia (Singapore, Hong Kong, Malaysia, Indonesia, and Thailand), and the other three were very small island economies (Cape Verde, Barbados, and the Seychelles), which because of their geographic separation may have been spared some of the worst effects of endemic tropical diseases.

The regression results forcefully point to the role of policy variables in determining the rate of economic growth. We find that openness to international trade is very strongly and positively associated with long-term growth, as much theory and previous evidence has indicated. We find that an economy open to trade during the entire period 1965-90 grew 1.97 percentage points faster per year (t=6.20) compared with an economy that was completely closed throughout the period. This result is consistent with Sachs and Warner (1995), and indeed a long tradition of studies of growth and trade, which have shown that integration with the global economy is associated with faster growth. The East Asian countries were among the most open of all developing countries between 1965 and 1990, a fact that helps to account for their better growth performance. Following an initial stage of modest import substitution, most of the fast-growing Asian countries lowered import tariffs and export taxes, removed quantity restrictions on trade, and reduced the barriers to international flows of capital. Although import barriers remained high in some sectors in certain countries, each of the successful East Asian countries ensured high profitability for manufactured exporters. They gave exporters easy access to inputs at world market prices by following prudent exchange rate policies, and by developing new institutions, such as export processing zones and duty drawback systems, to support export-led growth.

The PRC provides a clear and dramatic example. The PRC transformed itself from one of the most closed economies in the world in the 1960s to a moderately open one in the mid-1990s. When it began its program of economic reforms in the late 1970s, total trade was the equivalent

of an astonishingly low 1 percent of GNP. Even today, the economy is far from fully open. However, like the East and Southeast Asian countries, the PRC introduced facilities to help exporters circumvent these distortions and to compete on world markets. Other Asian countries have remained more closed to trade. South Asian countries generally isolated themselves from the global economy by imposing high tariff rates and a plethora of controls on imports in order to protect domestic industries. Only very recently have these countries, led by India, begun to open themselves to the global economy.

Government saving has a positive and statistically significant impact on growth. The estimated coefficient implies that a 10 percentage point increase in the government saving-GDP ratio is associated with higher growth of 1.2 percentage points per year. Countries in which governments kept spending programs under control and realized larger surpluses on their current budget grew substantially faster than those with smaller surpluses or deficits. Such surpluses financed government investment programs, and had a net positive impact on total national saving, as we discuss in more depth later in the paper.

Our third policy related variable is the quality of government institutions vis-a-vis market regulation. As expected, countries with more constructive interactions between the government and the market tended to record faster economic growth. According to our estimation results, each increment of 1.0 in this index (which is measured on a scale from a low of 0 to a high of 10) is associated with an increase in the growth rate of 0.25 percentage points. Thus, the difference between the Philippines' relatively poor score on institutional quality (2.97) and Singapore's high rating (8.56) accounts for a 1.4 percentage point difference in their average annual growth rates.

Finally, demographic variables are strongly associated with differences in growth rates. Both of the population change variables are of the expected sign and approximately the expected magnitude. As we discussed previously, in theory, the estimated coefficients for the growth rates of the working-age population and the total population should be 1 and -1, respectively. The empirical results do not permit rejection of these hypotheses, since the estimated coefficients (1.13 and -0.77) are not significantly different from 1 and -1, respectively. Bloom and Williamson (1997) explore these issues in much more depth. The important, and usually unrecognized point, is that part of East Asia's rapid growth in income is simply due to the rising share of the working age population among the total population between 1965-90. In South Asia, the share of the working age population increased much more slowly, partly accounting for that region's slower growth performance. These patterns are likely to change in the near future, as we discuss later in the paper.

We find evidence for a non-linear relationship between life expectancy at birth and economic growth. At low levels of life expectancy, further increases are strongly associated with more rapid economic growth. In this range, higher life expectancy probably boosts growth by increasing the supply of working-age labor (as a result of lower morbidity); by raising labor productivity (as a healthier population is also a more productive one); by raising the rates of human capital accumulation (as people are more likely to invest in skills and education if they live

longer); and by promoting more saving for retirement. Higher life expectancy in East Asia in 1965 (63 years) gave the sub-region a higher growth potential than South Asia, where life expectancy was just 49 years. But the positive effect on growth diminishes as life expectancy increases, and once it passes 68 years, further increases actually have a *negative* effect on growth. The most plausible explanation for this shift is that after 68 years, further increases in life expectancy indicate that the retired age population is living longer and consuming out of their lifetime savings, with a negative impact on aggregate growth.

Columns 2 and 3 show the results after adding regional dummy variables for East and Southeast Asia (combined), South Asia, Latin America, and sub-Saharan Africa. In each case, these regional variables are insignificant, and there is little change in the estimated coefficients of the other explanatory variables. This result indicates that the basic set of explanatory variables account for most of the differences in growth rates between these regions and the full sample.

Of course, these results represent the "average" relationships across countries, rather than a precise recipe applicable to all countries across time. Some individual countries undoubtedly differ in terms of the magnitude of the relationships, and in terms of the list of the most important variables affecting growth. Nevertheless, the basic specification captures the broad relationships influencing economic growth across countries very well. The adjusted R for our base specification is 0.87, indicating that this set of variables explain about 87 percent of the variation in growth rates across the sample, a strong result for this kind of analysis.

In particular, the basic specification tracks the actual growth performance of Asian countries very well. The "fitted" growth rates for each country (calculated by multiplying the estimated coefficients by the actual value for each variable for each country, and adding these terms together) correspond closely with the actual growth rates in most cases. For example, the fitted growth rate for India for 1965-90 is 2.16 percent, compared to the actual rate of 2.03 percent. China's fitted growth rate is 5.30 percent, compared to the actual rate of 5.09 percent. The largest Asian outlier is Malaysia, for which the fitted growth rate (3.53 percent) fell below the actual rate (4.49 percent) by about one percentage point. Indonesia was also a relatively large outlier. These differences are most likely due to Malaysia's and Indonesia's ability to deftly manage the challenges that accompany natural resource abundance. As we discussed earlier, natural resource abundance has been associated with relatively slow economic growth during the last several decades. Malaysia and Indonesia managed to avoid the most deleterious effects of the Dutch disease and disruptive terms of trade shocks by diversifying their economies (exploiting a wide range of natural resources as well as encouraging manufactured exports) and reacting quickly to changing international circumstances.

On a regional basis, the basic regression accounts for 6.6 percent growth for the "Four Tigers," very close to the actual rate of 6.7 percent during the period. Similarly, the fitted growth rates are close to the actuals for Southeast Asia (3.4 percent fitted versus 3.8 actual), South Asia (2.1 percent fitted versus 1.7 actual), and almost exactly the same for sub-Saharan Africa (0.7 percent fitted versus 0.6 actual) and Latin America (0.8 percent fitted versus 0.8 actual).

Variations in Sample Size and Specification

To test the robustness of these results, we re-estimated the equation with two subsets of countries. First, one-fourth of the countries in the sample were randomly dropped (by eliminating every fourth country in alphabetical order). The estimation results were broadly similar to those from the full sample, as shown in Table 3b. We then used these new results to estimate fitted values for the one-fourth of the countries that we omitted. The fitted values matched the actual values with a correlation of 92 percent, a very satisfactory result. Second, we dropped the 14 Asian countries from the sample to check the extent to which the Asian countries may have been influencing the overall results. Once again, the results (shown in Column 2 of Table 3b) were broadly similar to our base results. In this case, the fitted values for the omitted Asian countries matched the actual values with a correlation of 93 percent.

Table 3c shows the results from several alternative specifications. We tried many alternative measures of education and human capital accumulation, with little success. For example, column 1 shows the results using primary school enrolment rates rather than average years of education, with slightly weaker results than with our base specification. Column 2 uses adult literacy rates as the education indicator. The results are similar and perhaps a bit stronger than in the base specification, but data on literacy rates in 1965 are available for only 60 countries. Columns 3 and 4 show the results after substituting government consumption and total government expenditures, respectively, for the government saving rate. The results are similar to, but weaker than, our basic results.

Table 3d shows the results using the national saving rate as a regressor instead of the government saving rate (column 1). Conceptually, this specification is preferable to our base specification, since national savings is more consistent with underlying neoclassical theory as a determinant of economic growth. However, economic growth also affects savings rates, and this simultaneous relationship makes interpretation of the results problematic. Another problem bedeviling such an approach is that national saving rates, and in particular private saving rates, tend to be measured with substantial error, as they are calculated as a residual from the national accounts. Similar problems affect the results using the investment rate (column 2).

One way to treat the simultaneity issue is to employ a two-stage estimation procedure using instruments for the national saving variable. Column 3 shows the results when national savings is instrumented by the 1965-90 average of the young-age and old-age dependency ratios (both defined in Section IV), the government saving rate, and government social security expenditures as a share of GDP. Column 4 adds three additional instruments: bank credit outstanding to the public sector, the ratio of broad money to GDP, and the inflation rate. This more complete list is consistent with our base specification for the determination of national saving rates, discussed in Section IV. The results from the instrumental variables approach are very similar to our basic growth results. They suggest that a 10 percentage point increase in the national saving rate is associated with a 0.6 percentage point increase in the per capita growth rate. The estimated coefficient for the other variables remain close to their original values, with

two exceptions. First, the estimated coefficient on the natural resource variable is a much larger negative. Second, life expectancy no longer displays a quadratic shape, and is better estimated by a simple logarithmic function. The negative impact on growth from life expectancy after the latter reaches 68 years disappears in this specification, reinforcing the idea that this trend indeed arises through the impact of longer life expectancy on private saving rates. Overall, the results with the instrumental variables approach are consistent with, albeit somewhat weaker than in our base specification.

In addition, we considered several other possible explanatory variables for economic growth. We explored the impact of inflation, the initial distribution of income, political stability, and political rights. Each of these variables turned out to have a statistically insignificant impact on growth in our sample once all the other explanatory variables are included, as shown in Table 3e. The same was true of levels of foreign debt, financial depth (proxied by M2/GDP), prevalence of malaria, components of government spending, and so on (results not shown). Note that these results do not necessarily mean that these variables are unimportant, especially in some countries. In some cases, it indicates that some of the effects of these variables on growth are captured by the variables already included in the regressions. For instance, inflation rates are closely related to openness and government saving, and the effects of political instability are at least partially captured by the index of institutional quality and the government saving rate.

Column V of Table 3e shows the results when income levels and growth rates are converted by official exchange rates and expressed in constant U.S. dollars (from the World Bank data base), rather than in international (PPP) dollars. Although there are some modest changes to the estimated coefficients, the main results hold firmly -- there is strong evidence for conditional convergence, and the policy variables remain strongly and positively associated with economic growth. The overall fit is much weaker with these data, which is not surprising given that they are conceptually inferior to the PPP-adjusted data for international comparisons of per capita income.

Economic Growth of the Asian Countries in Comparative Perspective

These results also allow us to undertake a simple "growth accounting" exercise that explores the relative contribution of each of the explanatory variables in the basic regression to differences in growth rates across regions. Table 4 presents the results. For ease of presentation, and because of the strong interest in explaining the very rapid growth of most of the countries of East and Southeast Asia, we use the ten countries in this geographic region[6] as the benchmark, and account for the differences in growth rates between this group of countries and the other regions. Average per capita growth for the four South Asian countries was 2.9 percentage points lower than the average for East/Southeast Asia, and the basic regression can account for a difference of 2.5 percentage points. South Asia started with a lower per capita income in 1965, which, all else being equal, should have led to a growth rate 0.5 percentage points *higher* than in

[6] The ten economies in our sample from the East/Southeast Asia geographical region include the PRC, Hong Kong, Singapore, Korea, Taiwan, Thailand, Malaysia, Indonesia, the Philippines, and Papua New Guinea.

East Asia. However, the positive effect on growth from low initial income was partially offset by the negative effect from low secondary school attainment. Similarly, natural resources and geography had little net effect on South Asia's performance. South Asian countries have fewer natural resources and are located in more temperate climates, on average, than the nine East/Southeast Asian countries, giving them additional potential for faster growth. The net effects of initial income, education, geography and natural resources are relatively small, and suggest the potential for *faster* growth in South Asia by 0.5 percentage points relative to East/Southeast Asia.

By contrast, policy choices had a relatively large effect on differences in growth rates. *The combined effect of differences in government saving, openness, and the quality of institutions reduced South Asia's growth rate by 2.1 percentage points relative to its East/Southeast Asian neighbors.* Openness was by far the most important variable: South Asia's inward-oriented trade strategy accounted for slower growth of 1.2 percentage points. Finally, South Asia received less of a boost from demographic change than did East/Southeast Asia. South Asia had lower life expectancy, slower growth in its working age population, and faster overall population growth. These three factors accounted for 0.9 percentage points slower growth in South Asia relative to East/Southeast Asia.

The strong relationship between policies and economic growth is also visible in the comparison between East/Southeast Asia and sub-Saharan Africa (SSA). Between these regions, 1.7 percentage points of the predicted difference in growth rates is due to policy variables, with differences in openness again explaining the bulk of the difference. The demographic variables also explain much of the difference in growth rates. SSA's lower life expectancy and more rapid population growth (relative to growth of the working-age population) accounted for slower growth of 1.9 percentage points. In addition, all of the geography and natural resource variables worked against countries in SSA. There are more landlocked countries in SSA than any other region in the world, and countries in the region, on average, have more natural resources, are more tropical, and have less coastline relative to their area than the countries of East/Southeast Asia. These four variables combined accounted for 1.0 slower growth in SSA relative to East/Southeast Asia.

With respect to Latin America, initial conditions play a more prominent role, mainly because Latin America started with higher income per capita, which reduced its relative growth potential. However, the largest difference between Latin America and East/Southeast Asia lies with the policy variables, which together account for 1.8 percentage points slower annual growth in per capita incomes.

The key lesson from the growth accounting exercise is that initial and resource conditions account for only moderate differences in growth rates. The major role is played by policy variables: high rates of government saving, trade openness, and maintenance of good institutions have been the most important factors behind East Asia's rapid growth during the last three decades.

The cross-country growth regressions provide a useful starting point for exploring the past and future of Asian developing economies by furnishing a framework which identifies many of the most critical factors that distinguish growth performances across regions and countries. However, this framework, by itself, obviously does not fully explain the process of economic growth. It does not wholly capture the relationships between policy choices, institutional settings, and economic outcomes, nor does it shed light on the important role of economic leadership and skillful policymaking. To complement this simple framework, we must further explore the ways in which the fast growing Asian economies were either similar to or different from other developing economies, and how these factors might have affected Asia's economic performance.

II. More Evidence on How East and Southeast Asia were Different

Another way to gauge Asia's distinctiveness in an international perspective is to analyze how much Asia's sub-regions differ from other countries on a broad range of economic indicators, such as trade ratios, industrial shares, and government spending. One approach would be to simply compare average values of these variables in Asia with averages for other regions of the world. However, simple averages can be misleading, because differences across regions might themselves be due to other factors, such as levels of income or geography. For example, Korea and Taipei,China's relatively high trade ratios may simply be due to the fact that they have smaller populations and higher incomes than most developing countries.

Controlled Averages Across Countries

A more informative approach would be to examine differences across regions after controlling for structural and geographic variables. We examine controlled averages by estimating the following relationship for a group of 77 countries from all over the world:

$$X_i = \alpha_0 + \alpha_1 \ln y_i + \alpha_2 \ln y_i^2 + \alpha_3 \ln N_i + \alpha_4 \ln N_i^2 + \alpha_5 LD_i + \alpha_6 SD_i + \alpha_7 DR1_i + \alpha_8 DR2_i + A$$

X_i is the variable under consideration in country i, y is per capita income, and N is population. LD is land density (area of land per person), a measure of resource abundance; SD is the shipping distance to a major industrial port,[7] DR1 is the young-age dependency ratio, and DR2 is the old-age dependency ratio.

[7] Shipping distance is measured as the distance by sea of each country to the closest of three major industrial centers (New York, Rotterdam, or Tokyo). For landlocked countries, we add 1,500 miles to account for the extra cost of overland transport and crossing additional international boundaries. This extra mileage is based on rough calculations of the share of inland transport costs in general cargo shipments from North America to Western Europe. Data are drawn from Lloyd's Maritime Atlas of World Ports and Shipping Places (18th edition) and Pace (1979, p. 89).

The main focus of our attention is *A*, which is a dummy variable for sub-groups of Asian countries. The sign and significance of the estimated coefficient for this variable will tell us to what extent Asian countries differed from other countries in the world for each of the dependent variables under consideration, after controlling for the other right-hand-side variables. The relationship is estimated three times, once each with three separate Asian sub-regional dummies for the Four Tigers, Southeast Asia, and South Asia.

The explore how these differences may have changed over time, we estimated these relationships in 1970 (actually, using average values for each variable for 1969 through 1971) and again for 1990 (using averages for 1989-91). The results are shown in Table 5a (for 1970) and Table 5b (for 1990). In each cell of the table, a "+" sign indicates that the coefficient on the Asian sub-regional variable was positive and significant, a negative sign indicates that the coefficient was negative and significant, and a blank indicates the coefficient was insignificant. The number of asterisks indicates the level of significance.

The results show that the Four Tigers differed from other countries in several important respects. First, exports and imports accounted for a significantly larger share of GDP in 1970 than other countries of the same size, income level, resource abundance, and demographic structure. Manufactured exports, in particular, were substantially larger in these four economies than elsewhere in the world. By contrast, primary product exports were significantly smaller. The same basic pattern held in 1990, except that primary product exports were no longer lower in East Asia (predominately because of Singapore's large petroleum product exports).

The second area in which the Four Tigers stand out is savings and investment. In 1970, savings rates in these economies were not significantly different from the rest of the world, and investment rates only marginally so. By 1990, however, both savings and investment rates were well above the average for other countries. Third, and related, the Four Tigers had slightly larger central government budget balances, and slightly lower rates of spending on social security, compared to other countries at similar income levels. Fourth, these economies recorded an unusually high level of average years of secondary schooling. As we saw earlier in examining the data for the cross country growth regressions, the Four Tigers' average of 1.5 years of secondary schooling was the highest of the developing country regions in our sample. Finally, theses countries were more urbanized than other developing countries, reflecting the presence of the city-states of Hong Kong and Singapore in the group. However, the difference was no longer statistically significant in 1990.

Note that the Four Tigers did *not* stand out from the other countries in the structure of its production: the share in GDP of agriculture, industry, total manufacturing, and services was not significantly different in these economies. *An important result, then, is that while the Four Tigers' share of manufacturing in GDP was not significantly different from other countries, its share of manufactured exports was highly significantly larger than other countries.* What set the Four Tigers apart was not manufacturing per se, but manufactured exports.

Southeast Asia differed from other countries in only a few dimensions in 1970 (higher exports and years of schooling, lower social security expenditures, and higher literacy rates and years of schooling). By 1990, however, they were following a pattern strikingly similar to the Four Tigers. Southeast Asia in 1990 recorded higher shares of imports, total exports and manufactured exports (but not manufacturing production), they saved and invested more than other countries, and they recorded a slightly larger central government budget balance. They also recorded slightly lower levels of urbanization.

South Asia, by contrast, followed a very different pattern. They did not record unusually high or low trade shares or investment and savings ratios. By 1990, their savings and investment rates were significantly *lower* than for other countries of the same size and income. The structure of South Asia's production was also different. They recorded unusually high levels of agriculture, and lower shares of industry and manufacturing. The one dimension in which they were similar to the East and Southeast Asian countries was schooling: they recorded significantly higher levels of average secondary schooling in both 1970 and 1990. However, their literacy rates were marginally below average in 1990.

Different Paths to Development Within East Asia

We should point out that in searching for these common traits across successful economies, we are not suggesting that there has been only one path to sustained development. The East and Southeast Asian countries differ widely in their resource endowments, human capital accumulation, population densities and structures, and political systems. They have faced different opportunities and challenges during the last thirty years, and chosen different economic strategies to achieve their goals. Among the eight rapidly growing economies, at least four different paths to development are apparent (Perkins, 1994).

Hong Kong and Singapore are small, urban, very open economies that have relied heavily on commerce and a free port service as the foundation for growth. They have few natural resources, but have well-educated workforces. Their basic strategy was to rely on free and open markets, backed by a competent civil service and a strong legal system. Both governments consistently welcomed and encouraged foreign direct investment. Of course, there are important differences between the two -- Singapore features many more state owned enterprises (generally operating profitably in competitive markets), and the government has been more active in encouraging the development of new technologies and promoting manufactured exports.

Korea and Taipei,China are also relatively small economies with few natural resources and a well educated workforce. Agricultural growth, spurred in part by land reform and green revolution technologies, contributed significantly to aggregate growth in the early stages of the take-off period. Both countries initially followed a strategy of import substitution for consumer goods. They kept the level of protection low and the duration of protection relatively brief, and did not extend protection to capital goods sectors. Both countries switched course to aggressively promote export production, with governments at times intervening forcefully in the

market with subsidies, special lines of credit, and controls on international capital flows. Both countries discouraged foreign direct investment. Again, there are important differences in their strategies -- Taipei,China encouraged small and medium enterprise development, while Korea relied on a small number of large conglomerates to meet its export goals.

Indonesia, Malaysia, and Thailand are larger countries with abundant natural resources and a smaller human capital base. As with Korea and Taipei,China, agriculture has played a critical role in reducing poverty and contributing to aggregate economic growth. These countries adopted much more protectionist industrial policies than the Four Tigers, with more extensive and longer lasting import substitution policies. Many sectors have remained under the control of state enterprises or heavily protected from competition for long periods of time, even when they have performed poorly. Nevertheless, each of these countries established mechanisms through which exporters could avoid the high costs associated with protection and become competitive on international markets. Once again, there are important differences: Malaysia welcomed foreign direct investment more than the other two countries, and concentrated more on exports of consumer electronics rather than textiles and apparel.

China's path to development has differed dramatically from other developing countries. The period of total state control and near autarky prior to 1978 was followed by a dramatic decollectivization of agriculture and gradual privatization and opening of the economy. The majority of the population continues to live in rural areas and depends on agricultural production. The government maintains a heavy hand in the economy through extensive state ownership of enterprises and widespread price and quantity controls. Nevertheless, the government has actively encouraged the development of privately owned export oriented firms by establishing facilities to allow exporters to avoid the most serious price distortions in the economy. Foreign direct investment, once completely banned, is now encouraged along the coastal areas.

These differences suggest that the road to sustained growth and development has differed in important ways across the region, with each country facing different obstacles, complications, and opportunities. Yet, despite these differences, there are several striking similarities in each country's economic strategy. This analysis of controlled averages in this section, combined with the earlier cross country growth regressions point to four key areas that are associated with rapid growth across all countries, and in which East and Southeast Asia differed from other countries:

- openness and manufactured exports;
- higher savings and investment;
- strong macroeconomic management, especially government fiscal policy; and
- education.

In our view, these common elements are the key to understanding rapid growth in East and Southeast Asia, and slower growth elsewhere in the region. We proceed by turning our attention

to the first three areas. Education is treated more fully in the companion papers by Don Snodgrass et. al., and Keith Lewin.

III. Exports of Manufactures

There is strong evidence indicating that the countries that have been most successful in expanding manufactured exports are, with very few exceptions, the same countries that have achieved the highest rates of economic growth during the past thirty years. This relationship is especially strong for non-resource-based manufactured exports (that is, excluding manufactured exports derived from natural resources, such as diamonds, plywood, and mineral manufactures[8]). For example, consider the group of 78 developing countries (with GNP per capita of less than $15,000, or PPP-adjusted income of less than 16,000 in 1994 international prices) with 1994 population greater than 1 million. Table 6 shows the division of these countries into fast and slow growers in both GDP per capita and weighted growth of non-resource based exports. The results are revealing. Only 12 countries (shown in the top row) recorded average annual growth in non-resource based manufactured exports equivalent to 1 percent or more of GDP during the period 1970-90.[9] Almost all of these countries were also in the group of fast growers: eleven of the twelve (shown in the top left box) recorded growth in GDP per capita of 3 percent or greater during the period. The relationship between rapid non-resource based manufactured export growth and GDP growth is highly statistically significant: a chi-squared test easily rejects (at the 1 percent level) the null hypothesis that the distribution of the number of countries in each cell in Table 6 is random.

There were only two countries -- Indonesia and Jordan -- that were able to record rapid GDP per capita growth without also achieving rapid growth in non-resource based manufactured exports. Indonesia attained high rates of economic growth without a large manufacturing base because of its unusually effective management of its natural resource base. Moreover, in the mid-1980s, Indonesia began to shift towards manufactured exports, and its growth rate accelerated. Jordan's growth rate has slowed considerably in recent years, so with more complete data it would shift to the bottom right box. Israel is the only country that achieved rapid manufacturing export growth without also recording 3 percent GDP per capita growth, and its growth rate was a very respectable 2.2 percent per annum. Israel's GDP growth also rose in the 1990s.

Export Growth, Global Integration, and Technological Development

One of the lessons of recent history - highlighted by the analysis above - is that even very

[8] Specifically, we exclude SITC (Revision 1) 0-4, 61, 63, 66, 68, and 9.

[9] The contribution of growth in non-resource based manufactured exports to GDP is calculated as the growth rate of these exports times their share in GDP.

poor countries without an abundance of skilled labor can achieve international competitiveness in manufactures. This was widely doubted fifty years ago. Prebisch (1950, 1959), Singer (1950) and others argued that reliance on *primary* product exports would not lead to rapid economic development and industrialization. They may have been correct in the broad sense, as indicated by the negative relationship between primary product exports and economic growth. It seems, at a minimum, that primary export led development creates difficult challenges for economic policymakers. Prebisch and Singer erred, however, in their conclusion that the only alternative for industrialization was import substitution through protection of domestic firms and withdrawal from the global marketplace. Their analyses seems to have not seriously considered the possibility of exports of manufactures, perhaps because the production of manufactures was so dominated by industrialized countries at that time. They were not alone: few economists at that time dreamed that poor developing countries could achieve rapid export growth in manufactures.

What is it about manufactured exports that supports overall economic growth? First, manufacturing export-led growth allows countries to specialize their production to a far greater degree than under import substitution. Developing country exporters can join in global production and distribution systems and use their comparative advantage in labor-intensive operations. For example, Malaysia was able to build up an electronics sector in the early 1970s almost from scratch, because U.S. manufacturers moved the labor-intensive parts of their production process there. Even though Malaysia could not design or produce computer chips, it was able to assemble and test them, both labor-intensive operations. When Intel invested in Malaysia in 1972, the country was quickly brought into a world-class production system that drew on its comparative advantage.

Second, a strategy of manufactured exports fosters technological progress. Rapid growth in manufacturing exports requires close links with multinational firms that provide intermediate inputs, technology, capital goods, and export markets. These linkages provide a powerful means through which firms can "learn by doing." There is no realistic chance of this occurring if a country is cut off from world markets through severe restrictions on trade and capital flows. No country can generate all the sophisticated capital goods and technology needed for high-quality investment projects by itself.

From an early stage, East and Southeast Asian firms bought most of their machinery and equipment abroad. For example, in 1970, capital goods imports accounted for about 50 percent of total investment in East and South East Asia, compared to 17 percent in South Asia, and about 35 percent in Latin America and sub-Saharan Africa. These imports of capital goods were an important conduit for bringing new technologies into the region. *Although several East Asian countries went through a moderate phase of import substitution for consumer goods, they did not attempt to provide protection for domestic producers of capital goods.* Even today in Korea - which produces more capital-intensive exports than any other Asian country - these exports are chemicals, ships, and automobiles, not machinery. For example, between 1991 and 1994, imported capital goods accounted for 73 percent of all equipment investment in Korea (IMF, 1994). This indicates the country's continued heavily reliance on imported foreign technology.

Third, manufactured exports provide the foreign exchange necessary to pay for imported raw materials and capital goods. One of the great ironies of import substitution is that even though the strategy is designed to save on imports, the vast majority of countries that followed this strategy eventually ran into balance of payments problems because they could not generate the foreign exchange earnings necessary to pay for the raw materials and capital goods they so desperately needed. By contrast, exporters of manufacturers are better able to pay for imported capital goods, and are therefore in a better position to tap into world-class technologies.

Manufacturing export growth confers a range of other benefits on an economy. In particular, success in exporting has important spillover and demonstration effects on other sectors of the economy. Exporters compete with other firms for resources and in particular labor. Labor practices in internationally competitive export firms often serve as a model for others to follow. Exports also allow a country to generate high corporate profits which contributed to rising national saving rates; and to absorb a growing labor force in labor-intensive products, thereby ameliorating the distribution of income. Pack (1989) and others have pointed out that export markets allow labor and capital to move rapidly from low- to high-productivity sectors without encountering diminishing returns. Exporters are also more likely to demand high standards of service from their suppliers and to exert pressure for improved infrastructure provision, maintenance, and management. Positive "externalities" such as these have helped to modernize the economies of East Asia and sustain their growth.

The critical element in manufactured exports, then, is the linkages between domestic firms, their foreign affiliates, and global markets. In Asia, these linkages took different forms. Foreign direct investment (FDI) was the primary connection for Hong Kong and Singapore. However, FDI initially played a limited role in Korea and Taipei,China. Both countries actively discouraged and even prohibited some types of foreign investments until the 1980s. They chose instead to import technology under licensing agreements and as part of original equipment manufacturing (OEM) arrangements. These allowed Asian exporters to produce goods under the brand names of U.S. and Japanese firms. Southeast Asian countries, especially Indonesia and Thailand, also limited foreign investment in manufacturing (although they were more welcoming in minerals) until the 1980s or even the 1990s. South Asia, too, severely limited foreign investment until recent years. Notably, where foreign investment has taken place, it has been heavily export-oriented.

Despite the modest flows of foreign direct investment, at least in earlier years, East Asian firms developed strong links with multinational firms. For example, most finished consumer goods exports were produced to precise specifications from overseas buyers' orders. In most cases, the buyers were either importer-wholesalers, or overseas manufacturers subcontracting to local firms. The first buyers to operate in the developing countries of East and Southeast Asia were from big Japanese trading houses, such as Mitsubishi and Mitsui. They in turn often sold in North American markets. Major U.S. trading firms followed, led by Sears, Roebuck, J.C. Penny, and others.

In order to establish relationships with reliable, stable suppliers, these overseas buyers often provided instruction and advice to exporting firms on virtually all aspects of business (Kessing, 1983). The successful Asian firms learned quickly, and developed the flexibility and acumen to manufacture a variety of constantly-changing designs. Some firms gained specialized knowledge of particular markets, others became skilled at quickly producing "knock-off" copies of samples, and still others specialized in producing higher-quality niche products. Successful firms also often took the initiative to travel to major developed country markets and visit actual and potential buyers, thus enriching their knowledge of business practices in industrialized countries. In each of these ways, exporting firms were better positioned than domestic-oriented firms to enhance their skills, adapt new technologies, and expand their production.

Determinants of non-resource-based manufactured export growth

Why have some countries been more successful than others at generating manufactured export growth? What factors determine a country's ability to compete in manufactured exports? Our earlier discussion suggest that a key condition must be openness to the world economy. Low tariff rates, the absence of trade quotas, and ease of international financial transactions are all likely to support competitiveness of exporters in international markets. Open economies will have greater access to new technologies, and are less likely to misallocate labor and capital to inefficient industries. *The key form of opening, most likely, is ready access to capital goods and intermediate inputs from world markets at world prices (i.e. without trade barriers).* Taxes on capital inputs and tariffs or quotas on intermediate inputs can impose a very high negative effective rate of protection on would-be exporters. This is especially true since in various labor-intensive processes (such as electronics assembly), the intermediate input content of final output can easily rise above 80 percent. Tariffs on intermediate inputs, therefore, can easily wipe out the profitability of labor-intensive assembly operations in a low wage country, since wage costs are less than 20 percent of total output. We discuss this particular issue in greater detail later in this section.

In addition, we would expect that *resource-poor countries* would be more likely to be successful manufactured exporters. As discussed earlier in the context of income growth, resource poor countries have fewer foreign-exchange earning options than do resource rich countries, and therefore may be more likely to focus on manufactured exports as a foundation for sustained development. Moreover, resource rich countries may have a higher reservation wage, making it more difficult for them to compete on world markets in labor intensive products.

A third factor is likely to be *geographical location* relative to major world markets. Countries that are located far from major commercial centers -- for example, in southern Africa or South Asia -- will have to pay more in transport costs for the imported inputs required for most manufactured products. In competitive world markets, higher shipping costs would have to be offset by even lower wages to allow a firm to compete. When profit margins are relatively small -- such as in many labor intensive activities -- a small difference in shipping cost can spell the difference between success and failure. Finally, *the size of the domestic market* may also influence

non-resource based manufactured exports. In larger countries, a greater share of manufactured products is likely to be sold on the domestic market, with a corresponding smaller share sold as exports.

To measure the relationship between these variables and non-resource based manufactured export growth, we estimated the following relationship:

$$x_i = \alpha_0 + \alpha_1 I_i + \alpha_2 N_i + \alpha_3 P_i + \upsilon_i$$

x_i is the annual growth rate of non-resource based manufactured exports in country *i* between 1965-90, where growth is measured as a share of the preceding year's GDP. I_i is a vector of initial conditions, including the size of the domestic market (real gross domestic product) in 1970. We also explore the possible influence of education (mean years of secondary schooling) and life expectancy at birth, both measured in 1970.

N is a vector of natural resource and geographic conditions, including the logarithm of land per person, a measure of resource abundance. Countries with more land per person are likely to have greater abundance of natural resources, and thus slower growth in manufactured exports. We use this measure of natural resource abundance rather than primary exports as a share of GDP to avoid possible spurious correlation between the latter and non-resource based manufactured export growth. We also include the log of shipping cost, estimated by the sea distance from each country to the closest of either Tokyo, Rotterdam, or New York. An extra 1,500 miles of sea distance is added for land- locked countries.

P represents government policy variables, including openness and the quality of government institutions. Countries with weaker institutions (e.g., more corruption, weaker legal standards) would be expected to recorded slower growth in manufactured exports. We also examine two additional policy variables -- investment and government consumption -- that may influence manufactured exports.

Estimation Results

The results of estimating the export equation for a sample of 65 countries are shown in Table 7. Note that we excluded Taiwan from the sample because of incomplete trade data. In addition, we eliminated Singapore and Hong Kong from the sample because their recorded growth rates for non-resource based manufactured exports were large outliers from the remainder of the sample, and we did not want these two economies to unduly affect the overall regression results. (Our conclusions, however, apply with great force to these two economies, so that they are not outliers in terms of key results). The basic set of results are in column 1, in which all of the estimated coefficients are of the expected sign, and significant at the 5 percent level or better. Openness is strongly associated with more rapid growth of non-resource based manufactured

exports. Open economies, on average, recorded a manufactured export growth rate 0.70 percentage points higher than closed economies. To give some idea of the magnitude of this result, recall that only 12 countries recorded weighted non-resource based manufactured export growth greater than 1 percent (and only five recorded growth rates greater than 3 percent) between 1970-90. The mean value was 0.87. The estimated coefficient on openness is highly significant and robust across specifications.

Resource-abundant economies were less successful in expanding manufactured exports, as indicated by the negative coefficient on land per person. A one standard deviation increase in the log of the amount of land available per person (st. dev. = 1.29) is associated with a decline in the non-resource based manufactured export growth rate of 0.25 percentage points per year. Similarly, more distant countries have a natural barrier to overcome that has made success in manufactured exports harder to achieve. The estimated coefficient on sea distance (-0.31) implies that a one standard deviation increase in the log of the distance (st. dev. = 1.09, or about 3,000 miles) decreases the manufactured export growth rate by 0.34 percentage points per year.

Countries with higher quality government institutions have recorded faster growth in manufactured exports. This results indicates that secure contractual and property rights, as well as lower levels of corruption, help facilitate manufactured export growth. For every one unit increase in the index of government institutions (on a scale of 1-10), non-resource based manufactured exports expand 0.1 percentage point. Finally, larger countries have had less success in expanding non-resource based manufactured exports. The negative coefficient on total GDP suggests that larger countries are more likely to divert manufactured products to the home market, reducing exports. Equation 2 includes government consumption (as a share of GDP) and life expectancy at birth as additional explanatory variables. Although the estimated coefficients are of the expected sign, both are insignificant. Equation 3 includes mean years of secondary schooling and investment as a share of GDP. Again, both variables are insignificant.

The last column shows the results including regional dummy variables (The Four Tigers are not included as a separate group because Taiwan, Hong Kong, and Singapore are not included in the sample). Each of the regional dummies is insignificant, indicating that the other explanatory variables fully explain the variation in growth rates across these regions. Including the regional dummies weakens the significance of the land and institution variables, reflecting the high correlation between these variables and the regions.

The Composition of Asia's Exports

The countries of East and Southeast Asia dominate the group of countries that have achieved rapid growth in non-resource-based exports and GDP per capita, as shown in Table 6. As exports have grown in these countries, the composition of the products produced has changed markedly. These changes have broadly followed changes in comparative advantage. In general, exports in most countries were initially dominated by primary products, and later shifted to labor-intensive manufactured products such as apparel. Some countries have further shifted their export

base to skill and technology-intensive products, especially electronics.

Primary products (and primary-based manufactures) accounted for over 90 percent of exports in nine of the fifteen Asian developing countries for which disaggregated trade data are available for 1970 (see Table 8a). These products varied across countries. Indonesia and Malaysia each exported rubber, palm oil, and petroleum; Myanmar, the Philippines, and the Solomon Islands exported wood lumber; and Thailand and Myanmar both exported rice. Coffee and rubber dominated Sri Lanka's exports, whereas the Philippines exported sugar and palm oil. Labor-intensive goods -- especially textiles and clothing -- accounted for 25 percent or more of exports in only five countries (Bangladesh, India, Pakistan, Hong Kong, and Korea). Hong Kong's exports were dominated by labor-intensive manufactures, which accounted for over sixty percent of all exports. Capital and technology-intensive products (including electronics, machinery, scale- intensive and other human capital-intensive exports) were much less common in most countries. Only in Singapore, Hong Kong, India and Korea did exports of these products account for more than 10 percent of exports, and only in Hong Kong did the share reach 20 percent. Even these small shares are seriously overstated, as some of these products -- especially electronics -- are actually little more than labor-intensive assembly in which the final output is technology-intensive.

By the 1990s, the picture had changed dramatically. Primary products accounted for more than 70 percent of exports in only three of the sixteen Asian countries for which data are available -- Myanmar, Papua New Guinea, and Western Samoa. Several countries had shifted their export base towards labor intensive products, including Bangladesh, Indonesia, Fiji, Sri Lanka, and Pakistan, although the size of the structural change was smallest for the relatively closed economies of South Asia. In the most advanced Asian countries, exports evolved towards capital and technology-intensive products, including more sophisticated electronics in all of the higher income Asian countries (Lall, 1997). In Singapore and Malaysia, for example, capital and technology-intensive products accounted for more than 50 percent of exports (though labor-intensive assembly operations remained important in these "high-tech" sectors). The PRC, India, and the Philippines are moving in that direction, with capital- and technology-intensive products accounting for 20-25 percent of exports by the 1990s. These newer exports continue to be based on comparative advantage, although that advantage is quickly shifting from labor-intensive to skill-intensive goods in many countries.

Textiles and Electronics

Two manufactured product sectors have dominated Asia's exports in recent decades: textiles and electronics. South Asia, of course, has been exporting textiles to the world for centuries. In East Asia, as with so many other manufactured products, textile exports have their origins in Japan. In the 19th century, Japan exported raw and spun silk, and then moved into cotton textiles. In the early years of the 20th century, Japanese entrepreneurs helped to organize and expand the textile industry in Shanghai, which then thrived for several decades. Following the 1949 Chinese revolution, much of Shanghai's textile industry moved to Taipei,China and Hong

Kong. In the 1960s, direct foreign investment from Japan into Taipei,China's textile industry reinforced this trend. Since the 1970s, the textile industry, especially its ready-made garments component, progressively moved to East Asia, to Southeast Asia, and in the more recent years, to PRC and Viet Nam. These movements were driven by the search for cheaper labor by the textile producers and exporters in the first place, but received a substantial boost as a devise to overcome quota restrictions imposed under the Multi-Fiber Arrangement (MFA).

More recently, a common export across the fastest-growing Asian countries has been electronics products. Some countries, like Malaysia, started their export drive almost exclusively in electronics. Electrical machinery alone accounted for over 20 percent of total exports in Malaysia, Singapore and Korea between 1990-94, and about 15 percent in Hong Kong, Thailand, and the Philippines. China and Indonesia also boasted rapidly growing electronics exports. In the Philippines, electronics exports expanded from near zero in the late 1980s to 40 percent of all exports in 1995. World electronics production has now shifted to Asia. In each of twelve major categories of world electronics exports (at the SITC 3-digit level), at least seven out of the top ten exporting countries in the world in the early 1990s were from East and Southeast Asia (UNCTAD, 1995).

Why are electronics exports so heavily concentrated in Asia? The seeds of Asia's electronics industry germinated in the 1960s when U.S. firms began searching for offshore production locations. Although Latin America and the Caribbean basin were obvious choices, firms were repelled by political instability, inward orientation, and record of expropriation of foreign capital in many of the countries in the region. The Cuban revolution and the resulting nationalization of many private companies was, at that point, very recent history. Many Latin American countries were openly hostile to foreign investment, as clearly demonstrated during Vice President Nixon's ill-fated trip to South America in the late 1950s.

Many Asian economies were equally uninviting, such as China, Vietnam, and, until the late 1960s, Indonesia. However, other Asian countries were much more open to foreign investment and new technology. Hong Kong, especially, proved to be an attractive location for U.S. firms. The Hong Kong economy was as open as any in the world, with a surfeit of low-wage workers available, many of whom has some English-speaking capabilities. Hong Kong sat astride the great sea lane between Japan and the Middle East and Europe. Perhaps most importantly, Hong Kong's status as a British territory provided some assurance of political stability and of a relatively well-functioning legal system. No other developing country could compete with this environment, so in the early 1960s the first U.S. electronics firms established themselves in Hong Kong. Once these firms became successful, it became easier for others to follow, first from the U.S. and later from Japan and Europe. It is important to recognize that in this initial success, Hong Kong did not attempt to "pick winners" -- rather, it is much more accurate to say that the winners picked Hong Kong! Hong Kong established an attractive, free-trade and low-tax environment, and the electronics firms decided to locate there.

This initial success also encouraged other Asian countries to emulate Hong Kong's

approach. Singapore, Taiwan, Korea, and Malaysia all made concerted efforts to establish more open trading regimes -- and most critically, *free trade for exporters* -- with an eye towards attracting electronics firms. They were very successful. Table 9 shows summary data on the location of offshore operations of major electronic component manufacturing firms in 1971 and 1974. Two features stand out. The first is the enormous concentration of these firms in Asia. 17 out of the 21 electronics offshore operations in 1971 were located in East and Southeast Asia; in 1974, 51 of 53 firms worldwide were located there. Almost all of the U.S., European, and Japanese electronics firms that invested offshore in the early 1970s located in Asia. The second is the huge expansion in the number of firms and the number of people employed by these firms in just the three years between 1971 and 1974. The number of firms in Asia tripled from 17 to 51, and the number of employees nearly quadrupled. At the same time, the four firms that were located in Mexico in 1971 had ceased operations there by 1974.

Table 10 makes clear why electronics firms were so attracted to Asia. These data, which are drawn from an early UNCTAD study of electronics firms, show the costs of producing radios receivers for the European market in 1974. Costs are shown for firms producing in Europe, Asia, and Africa, with the source of their materials either in Europe or Asia. Asian firms could produce 1,000 receivers for $12,849, below the cost of European producers and far below the costs of African producers. Asia's advantage over Europe was its access to cheaper material (from Japan) and its lower wages. As a result, Asian firms could produce less expensively than European firms, even after paying 14% duty to sell the product in Europe. In comparing Asian firms (column 2) with the least expensive African firms (which purchase their materials in Asia, column 4), two key differences stand out. First, handling/freight/insurance charges (line 2) for imported inputs were far cheaper for Asian firms, presumably because they were located so close to Japan, the source of materials. Second, African countries charged their firms an average of 20% duties on the imported inputs (line 3), while Asian firms paid zero duties. These costs more than offset Africa's advantage of lower wages. Because of just these two differences, African firms could not compete in the European market. We have already discussed the importance of the Asian countries' proximity to Japan in reducing their shipping and production costs. We now turn our attention to the second element -- low duties and free trade for exporters.

Manufactured Exports, Openness, and Industrial Policies

The recent experience of manufactured exports and economic growth in developing countries suggests that two elements are crucial for success: free trade (at least for exporters), and government institutions that help markets to work effectively. Many commentators have argued that one element or the other is the more important. However, the evidence from the most successful economies suggests that a combination of the two is required to achieve success.

The growth of manufactured exports in East and Southeast Asia over the past three decades cannot be reasonably portrayed as the product of generalized free and open markets throughout the region. Only Hong Kong, with perhaps the most open market in the world, can truly be classified as a laissez-faire economy. Singapore is in many respects also a very open

economy, but it still has significant state involvement and ownership. Without question, other Asian countries often strayed far from the neoclassical ideal of competitive free markets and limited government interventions. By some measures, price distortions in Taiwan and Korea (as well as Japan) were larger than the average for all developing countries, and larger than for Mexico, Brazil, and Pakistan (World Bank, 1993). Wade (1990) and others have shown that import tariffs and quotas were neither very low nor uniform in Korea and Taiwan. Some Asian countries intervened heavily, often brutally, in controlling labor markets. Most governments directed subsidized credit towards chosen industries. And all of the Asian countries (except Hong Kong and Singapore) pursued textbook-style (albeit limited) import substitution for some sectors.

Whether these interventions were effective is an important issue to which we return later in this paper. The main point at this juncture is that free markets were not always at the core of Asia's success -- *except when it came to exporters competing on world markets.* The common element between the open markets of Hong Kong and Singapore, the more interventionist states of Taiwan and Korea, and the natural resource abundant, more state centered economies of Malaysia, Indonesia, and Thailand was their orientation toward world markets and their overriding goal of expanding exports of manufacturers.

The competition in world markets for manufactured products is so intense that even moderate barriers to trade can spell the difference between profitability and loss for exporting firms. Exporters must be free to sell on world markets without cost-increasing restrictions to sell domestically. Even more important, exporters must have access to imported inputs unhindered by tariffs or quotas. Labor-intensive manufactured exports tend to have high import content, reaching as high as 85% of the export value for electronics components. Under these circumstances, even an import tariff as low as 18% (specifically, a tariff at the rate 15/85) can effectively wipe out the entire potential profitability such from exports.

Asian countries have understood this better than other developing countries, and have kept import tariffs relatively low, and especially low -- often zero -- for intermediate and capital goods used by exporters. They have also limited the use of quantitative restrictions on such imports. Table 11 shows average tariff rates on capital and intermediate goods as well as the share of imports of these goods covered by quantitative restrictions in 1985. The eight fastest-growing economies charged an average tariff on these goods of 12.5 percent. Hong Kong's tariff was zero, and Singapore's was 1.6 percent. Only two of the fast growing economies -- the PRC and Thailand -- imposed tariffs of greater than 14 percent.

It is very important to recognize that *even these figures overstate the actual tariffs charged to exporters*, since almost all of these countries provided facilities under which exporters could receive capital goods and imported inputs duty free (see discussion below). In contrast, the average tariff on imported capital and intermediate goods in South Asia was 50 percent. India's tariff of 132 percent more than doubled the price of imported capital goods for Indian firms. Nepal's average rate of 10.4 percent was the lowest in South Asia, but since almost all capital goods imported into Nepal had to be transported through India, the actual cost to Nepali

importers was higher than the nominal tariff indicates.

The pattern was similar for quantitative restrictions (QRs). Hong Kong, Korea, and Singapore imposed almost no restrictions on imports of capital goods and raw materials. The only East Asian countries to impose significant QRs was Taipei,China, at 38 percent of imports. But even there, exporters faced far fewer QRs than this figure suggests. The Southeast Asian countries imposed only moderate restrictions on these imports, with the exception of the Philippines. The extent of coverage of QRs was substantially higher in Bangladesh and India. India's combination of 132 percent tariffs and QRs on almost 90 of imports essentially prohibited domestic firms from importing the most advanced machinery, cheapest raw materials, and newest technology.

Other elements of open and flexible markets for exporters were just as important. For example, the successful Asian exporters allowed free entry and exit of firms into export manufacturing activities and imposed relatively low taxes. Hong Kong embraced these ideals most fully, with perhaps the most open markets in the world. Singapore also established open and flexible factor and output markets. Other Asian countries, by different means, established conditions resembling free and open international trade, at least for exporters.

Export Facilitation

The process of establishing these conditions for exporters, however, was far from automatic. Asian government played an active role in encouraging and supporting export firms. As Table 11 shows, the average tariff on capital and intermediate goods was relatively high in Korea, as was the share of imports covered by QRs in Taipei,China. Moreover, these simple average disguise a wide range of tariffs and QRs, as pointed out by Wade (1990). Factor markets were often distorted, and many prices were administratively determined. In purely theoretical terms, the best solution to address these distortions would have been for governments to attack them directly by removing price and quantity controls and reducing tariff rates. Hong Kong and Singapore basically followed this prescription by implementing very open trade regimes. For a variety of reasons, however, most other Asian governments either could not or would not remove these distortions directly. In some countries, this reluctance came from initial apprehension about the wisdom of an export-led strategy; in others, it was driven by the desire to protect vested economic and political interests.

As a second-best solution, governments in East and Southeast Asia created several innovative programs and institutions to provide the means by which firms could overcome these distortions and become competitive exporters. These facilities included subsidized credit, tax breaks, export processing zones, bonded manufacturing warehouses, duty drawback programs, privatization of customs administration, and direct export subsidies. Korea, for example, supported exporters with a complex system of export subsidies, cheap credit, and access to controlled imports. Taiwan used a similar range of interventions. A common element in each of the successful countries in East and Southeast Asia was at least one facility that provided

exporters with access to reduced or zero duties on capital and intermediate goods exports. Three of these facilities were particularly important: export processing zones (EPZs), bonded manufacturing warehouses, and duty drawback systems.

EPZs are enclaves located physically or administratively outside a country's customs barrier in which foreign and domestic forms are given access to duty-free imports, tax holidays and other incentives, and physical resources such as buildings and electricity, on the condition that they export all or most of their goods. A typical incentive package offered to firms locating within a zone includes tax holidays of up to 20 years, 100% profit repatriation, free access to foreign exchange, efficient customs clearance, preferential access to financing, and capital grants in the form of subsidized factory space or worker training. Some countries also explicitly limit union activity within EPZs.

EPZs grew rapidly during the 1970s and 1980s. By 1990, EPZs employed about 530,000 people worldwide (see Table 12), the majority of whom were young women. EPZs accounted for more than $13 billion in exports in 1990, equivalent to about 5 percent of total manufacturing exports from developing countries. EPZ firms concentrate mainly in electronics (Korea, Malaysia, Taiwan, the Philippines) and garments (Bangladesh, Indonesia, Sri Lanka). Malaysia's success in electronics exports can be traced directly to the establishment of the Bayan Lepas EPZ in Penang between 1970 and 1972. The Kaohsiung EPZ in Taiwan began exporting in 1966; by 1973 it employed 57,000 people (World Bank, 1992). Korea followed suit in 1970 with the creation of the Masan Free Export Zone. More recently, a major reason for the surge in electronics exports in the Philippines since 1992 was the government's success in attracting firms from the U.S., Japan, and Taiwan to locate electronics testing and assembly operations in export processing zones.[10]

EPZs have been especially popular in East and Southeast Asia, where about one-third of all EPZs are located, *accounting for two-thirds of all employees in EPZs worldwide*. They accounted for an important share of exports in several countries, including Malaysia and the PRC, and to a lesser extent, Taipei,China and Korea. In Malaysia, for example, exports from EPZs accounted for 74 percent of total exports of manufactured goods in 1980; in 1990, EPZ exports still accounted for 57 percent of the total (Sivalingam, 1994). Oddly, despite their success in East and Southeast Asia, they were little used in other parts of the developing world until the last decade. India operated six zones in 1990, and Bangladesh just one, and all of these were of very limited scale. There were only 4 EPZs operating in Africa in 1990. They have been much more numerous in Latin America and the Caribbean, but generally have been less successful there than in Asia, for reasons outlined below.

EPZs provide several attractions for developing countries (Warr, 1989; Hamilton and Svensson, 1982; Grubel, 1982; Rodriguez, 1976; Hamada, 1974). First and foremost, EPZs

[10] For descriptions of individual country experiences with EPZs in Asia, see Sivalingam (1994), Warr (1987a), Warr (1987b), and Warr (1984).

facilitate the creation of the administrative and physical infrastructure needed for export-led growth, even when important distortions remain in the rest of the economy. Second, and related, EPZs demonstrate the potential profitability of exports, both to other firms and to the host government. The success of these firms encourages other firms to export, and can help convince the government to change policies that inhibit the export competitiveness of the rest of the economy. Third, EPZs provide jobs for low-skilled urban workers. Because firms are competing on world markets, the potential for job creation is not limited to the domestic market, and wages can increase over time as workers gain experience and increase productivity. Experience in well-managed Asian EPZs has shown their effectiveness in creating export-related jobs, and in promoting rising real wages of industrial workers as experience and productivity rise. Of course, EPZs alone do not generally solve a country's unemployment problems, but they can make an important contribution both directly and through their demonstration effects to other exporting firms.

Fourth, EPZs have the potential to (eventually) create demand for locally produced intermediate inputs. The empirical record for creating backward linkages is mixed, however, and depends critically on the competitiveness of the domestic suppliers. Firms located in EPZs will not be interested in purchasing inputs from highly protected, high-cost domestic suppliers when cheaper and more reliable inputs are available on world markets. A major problem in creating linkages has been that domestic suppliers (which do not export directly) do not always have access to duty free imports for their *own* inputs, placing them at a competitive disadvantage with suppliers on the world market. These "indirect exporters" are usually ineligible for EPZs or duty drawback systems. Korea and Taiwan, and to a lesser extent Indonesia, have been successful in overcoming these problems and creating linkages to the rest of the economy.

Although many EPZs, especially those in Asia, have succeeded in creating jobs and spurring exports, others have failed. Some fail because of broader macroeconomic or political instability -- EPZs, on their own, will not attract foreign investment in a highly unstable economy. Others have failed because of unrealistic expectations. Hill (1994) points out that when zones have been located in underdeveloped areas (e.g., rural remote areas or small cities) as a means of jump-starting local industry, they are rarely successful. In addition, the success or failure of EPZs depends critically on their ownership, and the rules governing their establishment and operation. EPZs that have imposed requirements that inhibit firms' ability to export, rather than providing firms' with the flexibility to compete on world markets, have not succeed in encouraging export-led growth. For example, zones with high entry fees or strict regulations on hiring and firing workers are unlikely to attract investment and promote exports. In general, the effectiveness of EPZs stems precisely from their "enclave" nature -- that is, their ability to allow firms to circumvent the distortions and related costs (e.g., import duties, high marginal tax rates, restrictions on exports) that so often are present in developing economies and that inhibit firms from competing on world markets. Firms typically point to seven critical elements for successful zones:

- unrestricted access to inputs and foreign exchange;

- minimal government interference on production decisions (e.g., the right to hire or fire workers);
- favorable location with respect to ports, airports, etc.;
- reliable communication links;
- efficient management and administration of the zone (e.g., rapid customs clearance);
- guaranteed profit repatriation; and
- majority foreign ownership guarantees with well defined property rights.

A second, and closely related export facilitation institution used in Asia is bonded manufacturing warehouses. These warehouses are essentially single-factory EPZs, designed for larger firms producing exclusively for export markets. Approved warehouses, with a customs officer stationed at the site, can receive duty free imports of capital and intermediate goods and bypass other customs procedures. Firms post a bond as a guarantee against any duties that might be applicable to imports that are diverted to the domestic market.

A third, more broad-based method of assisting exporters is duty drawback systems, in which firms pay duties on imported inputs and are then reimbursed upon export of the final product. In some cases, firms with a strong history of compliance are exempted from paying duties on imported inputs, as long as they continue to provide proof of exports. In this way, duty drawback schemes provide exporters with access to inputs at world prices. The main advantage of a duty-drawback system is that a firm can choose its location, rather than being confined to a predetermined area such as an EPZ. This provides the firm with more flexibility, helps encourage backward linkages to the rest of the economy, and saves the government the cost of establishing the special zone. However, duty drawback mechanisms can be difficult to administer, and have been subject to some abuse, since duty free imports leak to the domestic market. Despite these difficulties, well designed programs have been used successfully in Singapore, Korea, Malaysia, and Indonesia.

None of these facilities, on their own, would have been enough to spur rapid export growth in Asia. The key point is that most of the successful countries in East and Southeast Asian used a *combination* of facilities to support exporters. Korea provides a good example. Korea had high and uneven tariff rates on imports in the 1960s and 1970s, and continues to do so today, especially for agricultural products. But very early in its post war development process, the Korean government ensured that these distortions did not affect export competitiveness by establishing a complex system of export subsidies, cheap credit, and access to controlled imports. At the core were facilities for exporters that allowed duty free access of imported capital and intermediate goods. Hong Won-tack (1979) described the early genesis of these initiatives:

> "The tariff law has allowed duty free imports of basic plant facilities and equipment for important industries since 1949. On the basis of this law, imports of machinery for export production received a tariff exemption from 1964 until 1974 when the tariff exemption system was changed into a deferred payment system on an installment basis. Capital goods imported for foreign investment projects were

also exempted from tariffs after 1960. After 1961, raw materials directly used for export production were imported duty free."

What is striking is that date that these facilities were introduced: as early as 1961, Korea was taking strong steps to ensure free trade for exporters. Later these facilities were complemented by two large export processing zones (which opened in the early 1970s) and over 200 bonded warehouses (by 1981). Exports from EPZs and bonded warehouses accounted for 15 percent of total Korean exports in 1981 (Rhee, 1994). Exporters located outside the zones used duty exemption and drawback facilities. Access to duty free imports was also provided to indirect exporters (domestic firms that do not export directly, but sell all of their output to exporting firms). In this way, indirect exporters could compete more readily with international suppliers, helping to deepen the backward linkages of exporting firms.

In Taipei,China, the shift toward export promotion began in earnest in July 1957, when the Bank of Taiwan began offering subsidized credit to firms that were attempting to penetrate export markets. In August 1959, the government unified the exchange rate, shifting incentives markedly away from import substitutes and towards exports. It also began to reduce tariffs and relax controls on imports of capital and intermediate goods used by exporters. In 1966, the government established the Kaoshing EPZ, the world's first EPZ for manufacturing. Two other zones were opened in the early 1970s. In addition, by 1981 there were well over 300 bonded manufacturing warehouses operating in Taipei,China. Together, exports from the EPZs and warehouses accounted for over 20 percent of the country's total exports in 1981 (Rhee, 1994). Almost all other exporters took advantage of a well-functioning duty drawback/exemption system.

Indonesia has used a four-pronged approach to support exporters since it began its deregulation program in the mid-1980s. First, broad-based tariff cuts reduced the cost of imported inputs for all domestic producers, including exporters. Second, the government introduced a successful duty drawback/exemption system, which was used widely by many manufactured exporters. Third, when weak customs administration threatened the export promotion strategy and undermined the government's revenue collection efforts, the government effectively privatized customs administration by hiring the Swiss surveying firm Société Générale de Surveillance (SGS) in April, 1985. SGS took over the investigation and clearance of import consignments worth more than $5,000, and customs control over exports and inter-island domestic shipping was abolished altogether. Although the SGS contract was expensive, government revenue collections rose sharply, and traders benefitted from more transparent, predictable, and rapid customs clearance.[11] Fourth, and more recently, Indonesia has had some success with its version of bonded warehouses. Indonesia had little success with its EPZs (outside of those on Batam Island) during most of the 1980s, largely because firms had to pay high entry fees and were forced to buy water, power, and security services from the owners of the zones at relatively high prices. Its newer bonded warehouses (*Entrepot Produksi Untuk Tujuan*

[11] Indonesia has been phasing out SGS involvement in customs since 1991.

Ekspor, or EPTEs) provide firms with much more flexibility in their location, employment policies, utility purchases, and other production decisions.

Asian exporters have also taken advantage of the facilities offered by industrialized markets to a greater extent than other developing countries. A good example is U.S. imports from developing countries under the Generalized System of Preferences (GSP), which are totally dominated by Southeast Asian countries. Table 13 shows that of the $18 billion in U.S. imports of GSP articles in 1995, the four Southeast Asian countries alone accounted for $10 billion, or 55% of the total. Malaysia by itself sent nearly $5 billion in GSP articles to the US, accounting for over one-fourth of the world total, more than any other entire *continent*. The only country that comes close to using the GSP facility as much as the Southeast Asian countries is Brazil, which exported $2 billion of goods under the system in 1995. The four East Asian NICs similarly dominated the U.S. GSP system until they became ineligible in the late 1980s.

Although EPZs, bonded manufacturing warehouses, duty drawback/exemptions systems and other facilities are only second best solutions to removing trade distortions, they have played an important role in accelerating the process towards openness to free trade in Asia. In each of the countries where these facilities were most successful, governments have subsequently introduced more broad-based tariff and quota reform. Although the causality from successful EPZs and drawback facilities to trade reform is impossible to prove, there are at least three reasons to suspect that this pattern is more than a coincidence. First, successful EPZs and drawback systems demonstrated that exports can be profitable, reassuring those who doubted the potential for developing countries to successfully compete in global markets for manufacturers. Second, these systems created a political interest group that supported exports. Third, some duty-free imports intended for use in EPZs and drawback systems inevitably leaked to the domestic market, undermining the high tariff walls protecting inward-oriented industries. It is tempting to speculate that as the "effective" levels of tariffs are eroded, it eventually becomes easier for the government to lower the actual tariff rates.

EPZs, bonded manufacturing warehouses, and duty drawback/exemption systems have become less important over time in countries that have eventually undertaken more broad-based trade liberalization. In some sense, these facilities work themselves out of a job: when a country begins to be successful with manufactured exports, it tends to reduce tariffs and remove other impediments to trade, reducing the need for export facilitation. Similarly, these facilities are likely to play a less prominent role in the future in other Asian countries as these countries lower tariffs in accordance with the WTO accords. But in situations were distortions remain, these innovative institutions created by government policy can help markets to work better and to provide the means by which firms can become competitive on world markets.

Industrial Policies

Not all forms of government intervention in Asia should be understood as contributing to the success of manufactured exports. Though some scholars have argued that the promotion of

heavy industry through industrial policies was critical to rapid growth (Amsden, 1989; Wade, 1990), careful international comparison does not support this view. Without question, three of the most successful countries in East Asia -- Korea, Taiwan, and Japan -- intervened heavily to promote specific import-substituting industries. Effective rates of protection in Korea, while moderate on average, were highly dispersed. In addition, an elaborate web of trade associations had informal but effectively exclusive rights to import certain goods (Luedde-Neurath, 1986). According to Wade (1990), Taiwan applied restrictions to over half of its imports as recently as 1984 (although, as we have seen, there were far fewer restrictions on imports for exports). In financial markets, Korea controlled both the allocation of credit and the interest rate through its state-owned banking system. The largest conglomerates, or *chaebol*, had access to subsidized credit, while smaller firms were forced to borrow in informal markets at much higher rates (Roemer, 1994). The government leaned heavily on the *chaebol* to meet export targets, and, during the 1970s, to invest in infant heavy industries. Taiwan also directed credit towards favored industries, although they used subsidized credit less extensively. Credits markets did not fully clear, and many small firms had to borrow in informal markets. The government supported this curb market by ruling that post-dated checks (which were the most popular credit instrument in the informal market) were recognizable by the courts as enforceable contracts (Biggs, 1991).

Were these policies at the core of Korea and Taiwan's success? Did they simply correct for other distortions in the economy, or did they give these countries an extra push that would not have been possible otherwise? Some of the favored industries were clear success stories, such as Korea's Pohang Iron and Steel Company and Hyundai Motor Company. But Korean industrial policy also had it failures, such as Korean Heavy Industries, and Okpo Shipbuilding, both of which avoided bankruptcy only with large state subsidies (Stern, et al, 1995). The Hanbo steel and construction group went bankrupt in early 1997, with serious adverse repercussions for the Korean financial system. Hanbo borrowed around $6 billion from financial institutions to build a large steel works that proved uncompetitive in the end.

Of course, the correct method of evaluating these kinds of industrial policies in Northeast Asia is to measure the net impact of these success and failures, and whether the economy would have done better in the absence of these interventions (Perkins, 1994; Smith, 1995, Haggard, 1990). It is possible that industrial policy did provide such a fillip to development in Taiwan and Korea, as several analysts have concluded based documentation of government interventions and case studies of success stories. However, to our knowledge, there are not any truly rigorous studies calculating the full benefits of successes and complete costs of failures that demonstrate that this is the case. Hughes (1993) has criticized the industrial policy literature for giving too little attention to the costs imposed by these policies, and several recent studies that have examined both successes and failures have cast doubt on the overall effectiveness of the interventionist strategies (Lee, 1996; Stern, et al, 1995). For example, Lee (1996) found no clear relationship between industrial policies (e.g., subsidized credit and tax incentives) and total factor productivity growth in Korea; and he found a significant *negative* relationship between trade restrictions and growth rates of labor productivity and total factor productivity.

Perhaps more importantly, import protection and directed credit in support of heavy industry clearly were *not* central to the success of Hong Kong, Singapore, Thailand, Malaysia, the PRC, and Indonesia. Hong Kong, of course, is probably the most open market in the world, and state intervention played little direct role in its industrial development (indirectly, the government's main role in industrial policy was probably the promotion of effective infrastructure facilities). Singapore intervened in favor of chosen industries, but in a very different way than the Northeast Asian economies. Singapore's industrial policy was always aimed at promoting export industries, at first in labor-intensive sectors and later in more skill-based manufactures and services, but always consistent with its comparative advantage. Around 90 percent of all of Singapore's manufactured exports are actually the products of multinational firms operating within Singapore. Its most important foray into promoting capital-intensive industries by artificially raising wages in the late 1970s and early 1980s was unsuccessful, and the policy had to be reversed when economic growth slowed. Singapore used tax incentives as its policy of choice, and stayed clear of using protectionist trade policies (except for a brief period of mild import substitution in the early 1960s) and never used subsidized credit. It also established several extremely well-run state enterprises to support its export industries.

In Thailand, Malaysia, and Indonesia, governments ruled the markets with a much heavier hand, and not always in support of export markets. Often, interventions were designed to provide economic favors for important individuals, families, and firms in return for political support, and have failed to support broader development objectives (Hill, 1996; Roemer, 1994). Roemer (1994) described government interventions in Southeast Asia as follows:

> Treecrop exports are cartelized, ostensibly to stabilize domestic prices, but actually to protect processors by reducing prices paid to farmers. Log exports are banned or heavily taxed to promote cartelized plywood industries that use political influence to retain their protection. Steel mills and cement plants are constructed by clients of the regime, or by the regime itself, behind high protective barriers that remain in place long after the industry is mature, stifling export growth from downstream industries. Technological advances, such as the auto industry in Malaysia and the airplane industry in Indonesia, are disciplined neither by competition nor by ambitious export targets. (Roemer, 1994, p. 251).

The major point is that while the promotion of heavy industry may have been beneficial in some identifiable cases, *it surely was not the common denominator that accounts for the rapid growth across East and Southeast Asia*. Instead, the common denominator was manufactured exports, supported by a regime best characterized as free trade for exporters. The varied experiences of the countries of East and Southeast Asia indicate that both an open market and a more interventionist approach that offsets other distortions can be made to work, as long as manufacturers face the acid test of operating on world markets, both for imported inputs and exports. *East Asia's successful industrial policy strategy was to support labor-intensive manufactured exports, not capital intensive heavy industries.*

Despite the different views amongst analysts of the effectiveness of industrial interventions in East Asia, there appear to be several areas of consensus (Roemer, 1994).

- First, to the extent that government's choose to use targeted industrial policies, they should be geared towards removing existing biases against exports and ensuring the competitiveness of exporters. Amsden (1989) argues that a critical aspect of Korean industrial policy was that export targets were "an objective, transparent criterion by which firm performance is easily judged."
- Second, government policies may be effective in pushing the pace of change in comparative advantage, but they will not be effective if they stray too far from the basic direction of market forces. Korea's Heavy and Chemical Industry drive and Singapore's attempt to move quickly into high-wage exports are two examples of the problems that can arise when governments try to force the pace of change too aggressively.
- Third, government interventions of the type employed in Taipei,China and Korea could only be successful in countries with an effective and disciplined civil service. The potential for replicability to other countries is limited, as indicated by the failure of these types of policies in the majority of countries where they have been attempted. Hill (1996) makes this point convincingly for Indonesia.
- Fourth, Korea and Taipei,China's example is probably not relevant in today's international trading environment. When these two countries employed interventionist strategies, few competitor countries paid close attention. But with the establishment of the World Trade Organization and the associated agreements reached in the Uruguay round of the GATT, developing country governments today would be prohibited to use policies such as subsidized and directed credit for exporters.

IV. Explaining High Saving Rates in Asia

Savings lies at the heart of economic growth theory. The early workhorse growth model developed by Roy Harrod (1939) and Evsey Domar (1946, 1947) linked growth directly and nearly exclusively to the savings rate. Solow's neoclassical extension, while providing for substitution between capital and labor, continued to focus on savings as the primary determinant of growth.

Savings rates in Asia were not unusually large thirty years ago, but they have grown substantially and are now among the highest in the world. As we saw earlier, savings rates were significantly larger in Asia than in other regions of the world in 1990, even after controlling for structural and geographical variables. We also saw the close association between government savings and economic growth. This section examines savings rates across Asia, and explores some of the factors that appear to determine private and national savings rates.

Savings rates in Asia: The Historical Record

In the 1960s and early 1970s, national savings rates in Asia were only slightly higher, on average, than in other developing regions (table 14).[12] Between 1965-69, national savings rates averaged 19.7 percent, 17 percent, and 9.5 percent in the Four Tigers, Southeast Asia, and South Asia, respectively, compared to 16.2 percent in Latin America. But these simple averages disguise substantial differences across countries. China, Hong Kong, Taiwan, Malaysia and Thailand all recorded national savings rates greater than 20 percent. Hong Kong led the way with an average of 25 percent, even during this early period. By contrast, Singapore saved only 13 percent of GNP in 1965, and averaged 16.9 percent over the five-year period 1965-69. South Korea saved just 9 percent in 1965, and 14 percent during 1965-69. Indonesia, in the midst of political and economic upheaval, recorded the lowest savings rate in East and Southeast Asia at 5 percent. India recorded the highest rate in South Asia at 14 percent, but Nepal's reached just 3 percent.

These patterns began change during the 1970s, when national savings rates rose in each country in East and Southeast Asia, as well as in China. Between 1970-79, national savings rates exceeded 20 percent in all of these countries, and surpassed 27 percent in Hong Kong, China, Malaysia, Taiwan, and Singapore. The spectacular rise in savings rates in Singapore is especially noteworthy, from 13 percent in 1965 to 30 percent in 1975 and over 40 percent in 1982 and each year thereafter. Similarly, Indonesia's savings rate jumped to 25 percent in 1976, up 20 percentage points in less than a decade. In South Asia, India's savings rate climbed steadily to 19 percent during the 1970s, Sri Lanka's grew slightly to 13 percent, and Nepal's reached 8 percent. However, in all the other South Asian countries, savings rates stagnated or fell, and averaged just 10 percent across the region. Despite these lower rates in South Asia, by 1990 savings rates for all of developing Asia were about 8 percentage points higher than the average for the rest of the world, after controlling for differences in income, population, and other structural characteristics.

The higher national savings rates in East and Southeast Asia are reflected by higher rates of both private and government savings in the region. Before examining these data, however, some caveats are in order. Public sector savings is properly defined as the current budget (or operating) surplus of all public sector institutions, including the central government, provincial and local governments, and state-owned corporations. Private sector savings is normally calculated as total national savings minus public sector savings, because more direct information on private savings usually is not available. However, that data on the basic components of public sector savings other than central government savings are generally very weak. (This, in turn, implies that private sector saving data are not always very reliable). For many countries, complete data on public sector savings are unavailable. Those countries that do report information on public saving generally limit it to the central government budget (the data on central government saving, when reported, generally are of higher quality than those on private saving, since they are derived from government budget data). We rely primarily on World Bank

[12] We define national savings to include transfers of income from abroad.

data for central government current budget balances as our basis for government savings rates, because it appears to be the most complete and comparable set of data available.

Central government savings rates have been especially high in Singapore and Indonesia, averaging 9-11 percent of GNP. Indonesia has long displayed strict fiscal discipline, enforced by a rule which prohibits the government from borrowing domestically to finance expenditures. Taiwan's government saved nearly as much, averaging 5-7 percent of GNP. Each of the other countries in East and Southeast Asia consistently maintained government surpluses of between 1-3 percent of GNP; in Thailand and Malaysia government savings reached 6-7 percent in the early 1990s. By contrast, government savings rates have been close to zero, or even negative, for all of the South Asian countries.

Private saving rates did not differ by as much as government savings across regions. India's private savings rate, for example, has hovered around 20 percent of GNP since the 1970s, and averaged about 22 percent between 1990-93. This latter rate is higher than either Indonesia or the Philippines recorded during the period, and only slightly lower than in Taiwan and Malaysia. Pakistan's private savings rate has been greater than 15 percent since 1983. On the whole, private savings rates across Asia have exceeded those in Latin America, and been more than double the average rate recorded in sub-Saharan Africa.

The Determinants of Savings

Why have national savings rates in Asia exceeded those of other developing countries, and why have they increased so rapidly since the 1960s? How are Asian savings rates likely to change during the next thirty years? These critical questions are not easy to answer completely. Despite the centrality of savings in growth theory, previous research has not reached a consensus on the determinants of savings, and the two-way linkages between savings and growth are not fully understood. Nevertheless, four broad groups of variables appear to play an important role in determining national saving rates: demographic factors (including dependency ratios and life expectancy), economic growth, government policies (broadly including central government saving, credit to the public sector, social security expenditures, and inflation), and financial sector development.

Demography

At the core of saving theory is the life-cycle hypothesis, which suggests that individuals pass through three broad phases of savings and consumption during their lifetimes (Coale and Hoover, 1958; Modigliani, 1970). First, children who have not yet reached working age consume more than they earn, resulting in negative savings rates for this age group. Second, during their working years (aged 15-64), individuals earn more than they spend, generating the bulk of an economy's savings. Third, after retirement, individuals generally revert to negative saving rates. Accordingly, the larger the young-age dependency ratio (population younger than 15 years as a percentage of population aged 15-64) and the old-age dependency ratio (population 65 years or

older as a percentage of population aged 15-64), the lower the saving rate. Although some analysts have found little connection between demographic composition and saving (Gersovitz, 1988, Deaton, 1992), others have found a strong relationship (Williamson and Higgins, 1996; Harrigan 1996; Masson, et al, 1995; Edwards, 1995; Leff, 1969). The ten East Asian countries stand out among developing countries in their demographic composition, especially on the young-age dependency ratio (Table 15). East Asia's young-age dependency ratio averaged about 64% between 1970-92 (the period over which we have complete data for a large set of countries world-wide), well below the averages for South Asia and Latin America, and substantially below sub-Saharan Africa's very high ratio of 86%. There was much less difference across regions in the old-age dependency ratio. East Asia and South Asia both recorded ratios of about 6%, and sub-Saharan Africa's ratio was actually slightly lower at 5.7%.

Similarly, a population's life expectancy is likely to influence savings rates. Low life expectancies tend to indicate high rates of infant mortality, widespread disease, and short time horizons, so savings tend to be quite low. As disease becomes less pervasive and life expectancy increases, individuals are more likely to be able to save more of their earnings. It is also possible that the relationship is non-linear, with the impact of increases in life expectancy diminishing as it gets larger. In other words, each successive one year increase in life expectancy may be associated with smaller increases in savings. Even as early as 1965, East Asia's average life expectancy was already 55 years, already far higher than South Asia's 47 years and sub-Saharan Africa's 42 years. Over the full 1970-92 period, East Asia's life expectancy averaged 65 years, compared to 59 years and 50 years, respectively. However, Latin America's life expectancy was higher than East Asia's, at 66 years, so life expectancy clearly does not provide a full explanation for differences in savings rates.

Economic Growth

Although economic theory closely links economic growth with savings, the precise nature of the relationship is unclear (Schmidt-Hebbel, et al, 1996; Harrigan, 1996; Edwards, 1995). There are several reasons to believe that rapid growth is associated with higher savings. For example, individuals may find it easier to save when their incomes are growing very rapidly. As long as consumption grows more slowly than income, saving rates will increase. Moreover, the simple mechanics of aggregating income and savings across age cohorts could lead to a positive association. In a growing economy, higher savings from the working age population is likely to increasingly outweigh the dis-saving of the non-working population. However, economic growth could also lead to lower savings. If individuals expect their income to continue to grow during their lifetime, they may adjust their current consumption upward, reducing savings rates. Most studies have found a positive relationship between income growth and savings rates (Harrigan, 1996; Edwards, 1995; Masson, et al, 1995; Carroll and Weil, 1993).

The relationship between savings and growth is further complicated because the causality is likely to run in both directions. Not only does growth foster saving (as discussed above), but economic theory identifies savings as a primary determinant of growth. The World Bank (1993)

referred to this two-way causality as the "virtuous circle" between growth and savings. In the empirical work that follows, we treat this simultaneity problem by estimating the relationship between savings and growth using instrumental variables for the economic growth rate. In an alternative specification, we estimate the relationship with the lagged (five-year average) rate of growth as a an explanatory variable in the saving equation, to test whether there is evidence that rapid growth precedes increases in savings.

Government Policy

Government policy can influence private saving, both through the rate of government savings and the size of the public sector social security program. Higher *government* saving is expected to be associated with lower *private* saving, as households partly compensate in their own saving behavior for shifts in government saving. The strongest form of this hypothesis, known as Ricardian equivalence, posits that any increase in government saving will be offset one-for-one by a fall in private saving, leaving national saving unchanged. If governments choose to borrow, far-sighted individuals will plan on the government raising taxes in the future to repay the debt. These individuals will therefore increase their personal savings to offset the decline in government savings. Previous research has verified a strong negative relationship between government and private savings, but has found little support for the strict one-for-one relationship of Ricardian equivalence. Most studies have estimated offset coefficients of between 0.40 and 0.65 (Harrigan, 1996; Edwards, 1995; Corbo and Schmidt-Hebbel, 1991). That is, a rise in government saving of one percent of GDP is associated with a fall in private saving of between 0.40 and 0.65 percent of GDP. Since the offset coefficient is less than 1.0, a rise in government saving increases total national saving, but by much less than one-for-one. If a 1.0 percent of GDP increase in government saving leads to a *reduction* of private saving of 0.40 percent of GDP (that is, an offset coefficient of 0.40), the effect on national saving, evidently, is 0.60 (= 1.0 - 0.40). Thus, the high government saving in most of East Asia is likely to be an important contributor to high domestic saving, but the effect is muted by the offset on private saving.

Available information on government savings is limited to central governments only -- few countries regular report data on provincial and local governments or state-owned enterprises. Indicators of saving by provincial governments or state owned enterprises are hard to find, as are related measures, such as the profits and losses of state-owned enterprises. One widely available measure that provides some indication of the financial state of the public sector is the amount of outstanding credit from the banking system to the entire public sector, taken from the monetary survey. Large amounts of outstanding credit indicate a large public sector with large debts to the banking system, and presumably lower rates of public sector savings. We expect, therefore, that credit outstanding to the public sector would be negatively associated with saving. Credit outstanding to the public sector averaged just 1.5% of GDP in East Asia, compared with 25% in South Asia and 14% in both sub-Saharan Africa and Latin America.

Real interest rates may also affect savings rates, but there is little consensus on this issue in the literature. Data limitations present a major problem. The specific interest rates which

governments report vary widely across countries, and many countries do not report interest rates at all. Perhaps more importantly, many countries have artificially fixed their official interest rates over long periods of time, so these data give little indication of the true time opportunity cost of money. Largely because of these problems, we were unable to find an interest rate series which we found sufficiently credible across a large number of countries through time to test this relationship. Instead, we estimate the relationship between savings and inflation. Inflation provides an indirect measure of real interest rates, since inflation erodes real returns on financial assets, undermining incentives to save. In addition, very high rates of inflation are indicative of wider macroeconomic instability, which can lead to capital flight, and lower national savings. In particular, very high rates of inflation -- such as the average of 196% recorded in Latin America between 1970 and 1992 -- may deter savings. In this view, East Asia's relative low inflation rates suggest a conducive environment for higher savings. One possibility is that at relatively low levels of inflation, the marginal impact of a change in inflation (say, from 8% to 10% may have little impact on aggregate saving. But once inflation reaches higher levels, people begin alter their saving behavior. We test this proposition by examining the impact of inflation greater than 20% on national saving.

The size and nature of government pension systems can also influence saving. Feldstein (1980) and others have argued that pay-as-you-go pension systems are likely to lead to lower savings, as households rely on future government transfers rather than their own savings for retirement purposes. Gokhale, Kotlikoff, and Sabelhaus (1996) found strong empirical support for this hypothesis in the United States, as did Edwards (1995) for developing countries. We use current social security expenditures by the government (expressed as a portion of current income) as a proxy for expected payouts from the system after retirement. Between 1970 and 1992, social security expenditures in East and Southeast Asia were, on average, just one percent of GNP, compared to 2.1 percent in South Asia and 3.8 percent in Latin America. However, analysis of this relationship is complicated by the presence of different types of pension systems in the region, from non-existent in many countries, to large statutory self-funding systems in Malaysia and Singapore.

The development of financial systems is also likely to affect saving. In countries with rudimentary banking systems, or artificially controlled interest rates, the incentive to save is lower. In contrast, countries with well-functioning and profitable banking systems, active and efficient stock and bond markets, and well-developed insurance systems offer individuals and businesses a wider array of remunerative mechanisms by which to save. In practice, the relationship between saving and financial market development is difficult to capture, not only because it is hard to find a good measure of financial market depth for many countries, but also because it could be that higher savings themselves promote deeper financial markets. We use a crude measure of financial depth, the ratio of broad money (M_2) to GDP. This ratio was far higher in East Asia (57%) than in either South Asia (33%) or Latin America (31%), in part indicating the more sophisticated financial systems of Singapore, Hong Kong, and other economies in the region.

Estimation Results

We estimated the impact of these variables on national saving rates for a sample of 72 countries for which the complete set of data were available. The data are organized in panel form, with each observation an average value for a five-year interval between 1970 and 1992 (1970-74, 1975-79, 1980-84, 1985-89, and 1990-92). We use a random effects generalized least squares estimation procedure. The results are shown in Table 16.

The estimated coefficient for the young-age dependency ratio is negative and highly significant, as suggested by the life cycle hypothesis. A one percentage point increase in this ratio is associated with a decrease in the savings rates of 0.19 percentage points. This negative association is consistent with Coale and Hoover's (1958) prediction that populations with a large portion of young people would divert savings towards care and maintenance of children. Higgins and Williamson (1996) and Harrigan (1996) obtain similar results with different methodologies. Thus, one reason for East Asia's high saving rates was that they were further ahead in the demographic transition than other developing regions, with fewer young-age dependents supported by each worker.

By contrast, the estimated coefficient on the old-age dependency ratio is statistically insignificant (shown in column 2), suggesting that the relative size of the population over age 65 is not a major determinant of difference in saving rates across countries. Given the small amount of variation in this variable across developing countries, this outcome is not completely surprising.

Life expectancy is another powerful determinant of savings. As expected, we find evidence for a non-linear relationship between life expectancy at birth and savings. At low levels of life expectancy, increases in life expectancy are associated with higher savings rates. The effect is large at first, with an additional year of life expectancy matched by a substantial jump in savings. For example, an increase in life expectancy from 40 to 41 years is associated with a 0.8 percentage point increase in the savings rate. Each successive one year increase in life expectancy is associated with smaller increases in savings, such that, for example, the increase from 60 to 61 years is matched by a 0.2 percentage point increase in savings. Moreover, once life expectancy reaches 68 years, further increases are associated with *lower* savings, as indicated by the negative coefficient on the life expectancy squared term. A plausible explanation is that at this stage, higher life expectancy is indicative of a larger retired-age population, and that retirees are living longer. Since retirees tend to consume out of their lifelong savings, national savings declines. This finding is consistent with the fact that savings rates in the United States and Europe have declined in recent decades, and are lower than in the upper middle income countries of Asia.

We find a strong relationship between lagged per capita GDP growth and national savings. Each one percent increase in the lagged growth rate is associated with about a one-third percentage point increase in national savings. Similar, but somewhat statistically weaker results are obtained using the contemporaneous growth rate. Because of the strong simultaneity between growth and savings, we also estimated the relationship using instrumental variables for per capita

GDP growth (column 4). The instruments are the variables from our basic growth equation in Table 3a, column 1. These findings provide some support for the idea of a "virtuous circle" between saving and growth, in which faster growth leads to higher savings, which in turn support more rapid growth. However, the strongest results are in column 1 using the lagged growth rate, suggesting that the most important channel leads from faster growth to higher saving. This is consistent with Carroll and Weil (1993), who used causality tests to conclude that growth positively affects savings.

The relationship between central government savings and national savings is very strong. Our results suggest that a one percentage point increase in the rate of government savings is associated with a 0.59 percentage point increase in national savings, with a t-statistic of 6.51. Government savings adds to national savings, but the effect is less than one-for-one, suggesting some offset through a decline in private savings. More specifically, our results indicate that a one percentage point increase in government savings is offset by a 0.41 percentage point decline in private savings, yielding an overall increase of 0.59 percentage points in national savings. Thus, our results reject the theoretical outcome suggested by Ricardian equivalence, which posits that increases in government savings would yield zero change in national savings, and instead point to a strong positive association between fiscal policy and national savings.

Similarly, the public sector's credit position with the banking system has a strong negative association with national savings. Each percentage point increase in credit outstanding (measured as a share of GDP) is matched by a 0.8 percentage point decline in national savings. A larger public sector credit position would tend to indicate less profitable state owned enterprises, creating a net drain on national savings. We also find a strong negative link between high rates of inflation (greater than 20%) and national savings. Countries with average rates of inflation greater than 20% have recorded national saving rates about 2 percentage points less than countries with more moderate inflation.

Government pension policies also powerfully affect national savings. Each one percentage point increase in central government pension payouts is associated with a 0.42 percent decline in national savings. This result supports Feldstein's (1980) hypothesis that with pay-as-you-go pension systems, individuals are likely to decrease their own savings as they expect to receive transfers from the government upon retirement.

Finally, we find evidence in support of a relationship between financial development and savings. Increases in our rough measure of financial development (broad money/GDP) are associated with higher rates of savings. Specifically, each ten percentage point increase in the ratio of M_2 to GDP is associated with an increase in the national savings rate of about 0.5 percentage points. This results suggests that households save more with more sophisticated financial systems that may offer more flexibility, choice, and security in savings instruments.

Column 2 shows the results with three other variables that might affect savings: the old age dependency ratio, degree of urbanization, and political instability. In each case, the estimated

coefficients are not statistically significant. Column 3 adds regional dummy variables for the countries in East/Southeast Asia, South Asia, Latin America, and sub-Saharan Africa. These dummies add little to the explanatory power of the regressions. Each of the estimated coefficients is insignificant, indicating that the other independent variables explain the broad differences in savings rates across regions. Still, the estimated coefficients for South Asia and sub-Saharan Africa are large. Moreover, the adjusted R^2 for these regressions, while very good compared to other statistical analyses of saving, indicate that we have explained less than two-thirds of the variation in saving rates across countries.

One way to gauge these results is to compare actual saving rates for Asian countries with the saving rates predicted by the regressions. In some countries, the fit is very good. For example, ... In other countries, there is a larger unexplained difference between the actual and predicted rates. While part of this may be due to data weaknesses, there is clearly much about the determinants of national saving rates that we do not yet fully understand.

Accounting for Differences Across Regions

Although the regression results provide some broad ideas of the most influential factors affecting saving rates, they tell us little about the relative importance of each independent variable. We can, however, use these results to determine the most important factors contributing to the differences in saving rates across regions. For example, average saving rates in South Asia were 12.7 percentage points lower than those in East and Southeast Asia, and the regression results can account for 9.9 percentage points of the difference (Table 17). The higher young age dependency ratio and shorter life expectancy in South Asia combined to reduce saving rates by about 2.9 percentage points. Government polices had a large impact on saving rates, especially central government saving and bank credit extended to the public sector. These two variables, combined with differences in social security expenditure and inflation rates, accounted by 4.4 percentage points lower saving in South Asia compared to East Asia. South Asia's lower economic growth rate reduced its saving rate by 0.7 percentage points relative to East Asia, and it lower level of financial sector development reduced savings rates by another 1.7 percentage points. In the case of sub-Saharan Africa, the regression results account for 15.0 percentage points of the actual difference of 15.8 percentage points relative to East Asia. In this case, the demographic variables are the most important factor, accounting for an enormous 9.5 percentage points of sub-Saharan Africa's lower saving rate. Policy variables and differences in financial sector development are also large contributors. In the case of Latin America, the combined affect of the policy variables account for 4.9 percentage points of the 9.6 percentage point difference in saving rates.

These results suggest that demography and government policy are the main determinants of saving rates across countries. Government policies can influence saving rates through higher rates of government saving, less bank credit to public sector institutions, lower levels of spending on pension systems, and greater financial sector development. More prudent government policies and smaller public sectors clearly had a positive impact on national saving rates in East Asia. East Asia's rapid demographic transition also supported saving rates, especially compared to sub-

Saharan Africa, where the transition lags. According to our results, differences in economic growth rates are one factor in accounting for saving rates, but its direct impact appears to be smaller than the impacts of policies choices and demography.

V. Governance, Leadership And Economic Management

There is little question that policymakers in East and Southeast Asia have been so much more successful than their counterparts in other regions of the world in managing their economies. Through the course of several turbulent decades, Asian governments maintained stable economies, even when economies in other regions spiraled out of control. As we have mentioned, Asian governments kept fiscal deficits under control. Rates of inflation have rarely exceeded 15-20 percent, and in most countries remain at 10 percent or lower, compared to rates well over 50 percent or higher commonly recorded across Latin America during the late 1970s and 1980s. Hyperinflation was nearly non-existent in Asia, with Indonesia's hyperinflation following the political and economic crisis of the mid-1960s the only case during the last thirty years among the fast-growing economies in East and Southeast Asia. More recently, both Cambodia and Mongolia have suffered through bouts of hyperinflation; in both cases, the government appears to have brought the situation under control. In addition, Asian policy makers deftly managed exchange rates, by-and-large avoiding major overvaluations and moving quickly to restore stability when foreign payments imbalances arose. With the exceptions of Indonesia, Korea, and the Philippines, governments did not rely heavily on foreign borrowing, and only in the Philippines did foreign debt evolve into a crisis. Macroeconomic management was especially challenging for the resource rich countries of Southeast Asia, which had to maintain stability through several commodity boom and bust cycles. As we have pointed out, nearly all other resource -rich developing countries (except Botswana) experienced intense macroeconomic instability and slow growth.

Less obvious, however, is *how* these governments have managed their economies so well. What set these governments apart? Why have they been better able than other governments to promote macroeconomic stability and long term-development? The reasons are far from fully understood, but several factors appear to have made a difference. Sustained political stability in most of these countries enabled governments to be consistent in their approach and to implement longer-term economic strategies (Lindauer and Roemer, 1994). Almost all of the successful Asian economies had stable political leadership, with few changes in heads of state and little shift in underlying economic direction. President Park led Korea for 18 years, President Suharto has ruled Indonesia for nearly three decades, and Lee Kuan Yew presided over Singapore's development for over a quarter of a century. Thailand's frequent changes in prime ministers make it an exception, but even there, economic policy-makers remained in their positions even when prime ministers changed, providing constancy to economic policy. Of course, stable political leadership is far from sufficient to engender sustained economic development. Look only at North Korea, Myanmar, and several other countries in Asia, as well as many countries in Sub-Saharan Africa with long-lived governments and poor economic performance.

Asia's successful governments can be differentiated from other long-standing governments by their ideas about and strategies for sustained economic development. Governments must have an approach for economic management and development than can be implemented and that will ultimately succeed in achieving long-term economic growth. During the past several decades, many perhaps well-meaning governments followed misguided development paradigms: extensive central planning with non-market allocation (in East Europe and the former Soviet Union for instance), long-term and widespread import substitution (throughout Latin America), or the extraction of resources from the agricultural sector to support urban industry (in many countries in sub-Saharan Africa). Numerous countries withdrew at least partially, if not wholly, from the world trading system in an attempt to develop more self-sufficient production systems.

In Asia, these kinds of ideas were manifested in their most extreme form in the communist regimes of the PRC (until 1978), the central Asian republics, North Korea, and later in Viet Nam, Cambodia and Lao PDR. In South Asia, although ideas about the role of the state in the development process were far less extreme, they had a profound impact on government strategy and policy choices. India, after its independence in 1947, followed the Fabian socialist ideals of its leaders (reinforced, no doubt, by the interventionist tendencies of the British colonial regime) to a planned and regulated economy. Other countries in the sub-region broadly followed India's lead. Market pessimism was influential in East Asia as well in the 1950s. Witness Taipei,China's and Korea's early import substitution strategy.

By the early 1960s, however, Japan's success with a more outward oriented strategy based on labor intensive exports began to strongly influence East Asian ideas on development strategy. Governments in Hong Kong, Taipei,China, Korea, and later Singapore, all were constrained by small domestic markets and were wary of the centrally planned, non-market approach advocated by the PRC. They could not help but notice Japan's success based on manufactured exports. Japan's influence was reinforced by the shared institutions that had developed in several countries following decades of Japanese colonial rule, and by the growing presence of Japanese firms throughout the region. Exports became even more appealing when U.S. foreign aid began to dry up in Korea and Taipei,China in the early 1960s. U.S. advice to Korea and Taipei,China amplified the case for export-led growth. Moreover, for strategic reasons, the U.S. took special measures to ensure market access to East Asian exporters.

East Asia's leaders were strongly committed to their strategy of stimulating exports and supporting rapid economic growth. In one famous example, President Park personally presided over monthly export meetings attended by senior government officials and business leaders, and continuously put a high priority on achieving annual export targets. Lee Kuan Yew was in many ways Singapore's chief salesman, never tiring of expounding on the attractiveness of Singapore as a destination for foreign investment.

Perkins and Roemer (1994) and others have argued that economic policy-makers and government leaders in some East Asian countries may have put an unusually high premium on rapid economic growth because they saw it as essential to the survival of their regimes. In the

1950s and early 1960s, many observers questioned whether such small and unstable countries as Korea, Taipei,China and Singapore could survive in the face of external threats. Failure to grow rapidly and distribute the gains relatively equitably might have doomed these governments, or even the existence of these nations. In Southeast Asia, national survival was less of an issue, but leaders nevertheless seemed to understand that political legitimacy and stability depended in part on a well-managed and growing economy, and in some cases, on improving the welfare of the rural poor.

To implement their development strategies, the successful Asian economies consistently placed well-trained, able economic technicians in charge of macroeconomic management. These technicians were given wide latitude in setting economic policy. For example, in most East and Southeast Asian countries, authority for establishing the budget rests primarily with the Ministry of Finance or a related board, and not with the parliament or cabinet. Perhaps even more importantly, government leaders consistently insulated economic policy-makers from political pressures, and supported them when they made tough decisions that placed long-term development ahead of short-term political expediency (Perkins and Roemer, 1994). Thailand's popular and revered monarchy protected senior economic policy-makers, despite frequent military coups and changes in the prime minister. President Park of Korea invariably shielded the Economic Planning Board from political pressures and kept the military from having undue influence on economic policy, as did President Suharto in Indonesia (Root, 1996).

Finally, in at least some of the more successful countries, policy implementation was aided a competent civil service. Singapore separated the civil service from the political party, and based promotions on competence rather than longevity. Similarly, Korea bases hiring and promotion decisions on examinations and on performance (Root, 1996). Korea upgraded the quality of economic analysis available to its policy-makers by establishing the Korea Development Institute in 1971, which could attract well-qualified technicians without directly hiring them into the civil service. Civil servants are generally well paid, especially in Singapore, both to enable the government to attract top talent and to diminish the incentives for corruption. However, civil service performance lags in the larger Southeast Asian countries, especially Thailand, Indonesia, and the Philippines.

VI. The Total Factor Productivity Debate

The "conditional convergence" framework that we elaborated earlier can be cast in terms of an aggregate production function. Suppose that GDP is a function of capital, K, labor, L, and a general efficiency parameter A, so that GDP = A * F(K,L). The efficiency parameter, in turn, will be a function of policies (for example, open trade will increase the division of labor, and therefore, efficiency), economic structure (for example, geography), and the level of technology. As a shorthand, we might write A = A(Policy, Structure, Technology). In this case, technology represents improvements in productive techniques, as well as the introduction of products with improved quality. The parameter A is typically called total factor productivity (TFP).

One of the debates about Asian growth involves the relative contributions of A, K, and L to overall GDP growth. Through standard techniques introduced by Solow (1956), it is possible to decompose the contributions of capital, labor, and the "rest" (designated by A) to overall changes in GDP. Note that even if we can get a meaningful measure of changes in A, we still have the problem of interpreting such changes as due to policy reforms or technological improvements. (Presumably the third determinant of A, the geographic and resource structure of the economy, while importantly affecting the *level* of A, may not necessarily contribute much to *changes* in A). However, even getting a meaningful estimate of changes in A can be problematic. Since it is calculated as the residual of the growth accounting exercise, what is labeled as TFP is actually a combination of errors in the data, omissions of other factors that should be included in the growth equation, as well as efficiency gains. As a result, there is a danger of reading too much into these data. Indeed, the residual has been referred to as a measure of our ignorance about growth.

One of the surprises of recent analytical studies (Young, 1995; Kim and Lau, 1994) is that changes in K rather than changes in A have apparently been the main engine of growth in Asia. That is, the rapid growth has been proximately caused by rapid capital accumulation rather than rapid advances in TFP growth. In his most surprising and widely quoted result, Young found average annual TFP growth in Singapore of -0.003 percent for 1966-90. Such results do not, in any way, invalidate our earlier findings about the importance of economic policies or structure. It simply requires that we interpret such findings carefully, in the following manner. *Good economic policies and a favorable economic structure raise the returns to capital and thereby stimulate rapid investments in capital. Without the good policies and the favorable structural conditions, the returns to capital would be much less, so that capital accumulation would be much lower, and overall growth would be much slower as a result.* At a minimum, Asia's policy stance and structural conditions allowed the countries of the region to accumulate capital more quickly than other regions, and thus grow faster.

Moreover, while changes in A are not the *prime* mover of Asian growth, in most countries changes in A nonetheless have made an important contribution to rapid East Asian growth. The debate over TFP is not an all-or-nothing proposition. Both growth in TFP and growth in capital have contributed to rapid output growth. In fact, as we see in Table 18a, TFP growth in the Four Tigers has been the highest among any region in the world, averaging 1.4 percent per year during the period 1970-92, according to recent calculations by Bosworth, Collins, and Chen (1996). By comparison, the industrialized countries in their sample averaged TFP growth of 0.6 percent annually during the same time period.

In addition, TFP growth rates have been rising over time in the Four Tigers, from an annual average of 0.7 percent in the 1960s and 1970s to 1.2 percent between 1980-86 and 2.8 percent between 1986-92. Bosworth, et al, found zero aggregate TFP growth in Singapore between 1970 and 1986 (similar to Young's numbers); the figure jumped to 4 percent annually between 1986-92. A separate, more detailed study on Singapore reaches a similar conclusion. Rao and Lee (1996) found annual TFP growth in manufacturing of -0.4 percent in Singapore between 1976-84; and 3.2 percent for the period 1987-94.

The debate over TFP growth is important. If most of East Asia's rapid growth were in fact the result of rapid increases in A, there would be less reason to believe in conditional convergence. It would be more likely that East Asia could continue to grow at current rates without a slowdown in the future. The fact that most of per capita growth is the result of capital accumulation, however, suggests that growth will slow down as capital deepening takes place (that is, as the capital-labor ratio rises sharply in the economy), since capital deepening will be associated with a declining rate of return to new investments. This is in fact the case in East Asia: as capital accumulation has progressed, rates of return on capital have declined, suggesting that indeed both capital accumulation and growth will taper off in the future.

Paul Krugman (1994) has provocatively compared the pattern of large capital accumulation and relatively small TFP growth in East Asia to that of the former Soviet Union, implying that East Asia might face a collapse in growth similar to that experienced by the Soviet Union. Although Krugman is correct that much of East Asia's growth was due to a rising share of capital to labor in the economy, and that growth rates are likely to fall in the future, his comparison of East Asia to the Soviet Union is mistaken.

As the capital-labor ratio rises, returns to new investment will tend to decline. This decline in profit rates is mitigated by two factors: (1) improvements in TFP (which thereby raise the marginal productivity of capital), and (2) a high substitutability of capital for labor in the basic production function. The second condition means that capital deepening (rising K/L) can take place *without* sharply reducing the profitability of new investments. Thus, in thinking about the prospects for future profitable investment, TFP growth is not the only measure of the production function that should be examined. As important, perhaps, is the elasticity of substitution between capital and labor. A high substitution elasticity signifies good prospects for continued profitable investments in future years.

The aggregate production function GDP = AF(K,L) is of course merely a fable, not a real production process. A real economy is based on millions of interacting productive units, and the technical mathematical conditions for aggregating those millions of separate activities into a single function are generally not fulfilled. Therefore, when we speak of *the* elasticity of substitution between K and L, we are speaking in parables as well. What is probably true, however, is that flexible economies, with a high degree of intersectoral mobility of capital and labor, will act as if there is a high elasticity of substitution between aggregate capital and aggregate labor. The Soviet growth strategy was based on the non-market allocation of capital under conditions of virtual autarky. As a result, the Soviet economy was inflexible and inefficient. Capital was administratively allocated to areas of the economy that had low or even negative productivities of capital. Empirical estimates of the aggregate elasticity of substitution between K and L in the Soviet Union have been very low (Easterly and Fischer, 1995). The conditions for investment in Asia are completely different. To a very large degree, investment is allocated under competition and -- especially in industry -- with an eye towards market conditions. The East Asian economies are far more flexible, and most investment is subject to a market test.

Although there are no internationally comparable statistics on rates of return on capital for a large number of countries, partial information exists for Hong Kong, Singapore, Taipei,China and Korea. According to data collected by the OECD, the rate of return on capital in Korea declined gradually from around 22 percent in the mid 1980s to about 14 percent in 1994. In Singapore, a comparable indicator - the rates of return on US foreign direct investment - fell from 27 percent in the late 1980s to 19 percent in the mid-1990s. In Hong Kong and Taipei,China rates of return fell from around 21 percent to 15 percent. While these declines do confirm the neoclassical prediction of declining returns to investment, and are consistent with the rapid accumulation of capital documented by Young and interpreted by Krugman, the important point is that they are still well above the worldwide average return on US foreign direct investment of 11 percent. *In contrast, the Soviet rates of return on investment fell from 26 percent in the 1950s to just 5 percent a decade later and to zero by the mid-1970s* (Easterly and Fischer 1995). Hence the flawed nature of the Soviet analogy. East Asian growth will not go the way of Soviet growth, because it is sustained by flexible markets, open economies, and high profitability rather than bureaucratic fiat. A more likely pattern is that growth will gradually decline, rather than collapse, as the income gap between East Asia and the advanced economies narrows.

VII. Growth Projections for Asia

The cross-country growth regressions estimated in section one of this paper can be used to construct long-term forecasts of economic growth for individual countries. We use the basic regression results from column 1 in Table 3a to project growth rates of real income per capita for 14 Asian countries for the period 1995-2025. The projected growth rates for the fourteen Asian countries in the sample are estimated by multiplying 1995 values (or the closest year possible) for each of the "Z" variables by the estimated coefficients, and adding the resulting terms, including the originally estimated constant term. (In effect, for the baseline projections, we begin with the assumption that every country will maintain its current policy stance for the next 30 years). The values for the geographical and structural variables remain the same as in the base projections, except the natural resource abundance variable (natural resource exports as a share of GDP) is updated to its 1995 value. For the demographic variables, we use the projections for the 1995-2025 period from the United Nations population database. For Malaysia, which was the largest outlier of the Asian countries in the estimated growth relationship, we added the difference between the "fitted" and actual growth rates for the 1965-90 period (about one percentage point) to the projected growth rate. This change reflects the subjective judgement that the model's relatively large under-prediction of Malaysia's past growth suggests the strong possibility of an important under-prediction of the future. A likely reason for Malaysia's strong performance in the past (relative to the model's prediction) is its ability to manage the challenges arising from natural resource abundance better than most other resource abundant countries. Assuming that this strong management continues, it seems reasonable to add the error term to the projected growth rate. This adjustment was not made for any other country.

Of course, these projections are meant to be indicative, rather than precise. Many factors will influence income levels and growth rates in ways that cannot possibly be foreseen or predicted

accurately. No allowance is made for the possibility of major wars, breakdowns of open trade, substantial changes in world commodity prices (such as the oil price shocks of the 1970s), financial crises, or significant technological breakthroughs that could fundamentally alter the global division of labor. Nor can important changes in individual countries be foreseen. The estimates are simply an attempt at highlighting broad current trends that have an important bearing on growth. The precise estimates of each country's growth rates are less important in this exercise than the broad direction of change over time. These estimates are much better, however, than naive extrapolations of recent growth, in that they explicitly take into account the implications of conditional convergence -- therefore building in the proposition that countries tend to grow more slowly as they rise in income levels relative to the technological leader (assumed to be the United States).

In comparing these projected growth rates in Table 19 to actual growth during 1965-95, three forces are at work. First, for most countries, higher levels of education and life expectancy and improved policies (relative to the earlier period) lead to increased growth rates. Second, operating in the opposite direction, as incomes rise, growth rates fall in accordance with the convergence condition. Third, demographic shifts will slow growth in aging societies and spur growth where fertility rates have fallen more recently and the workers make up a larger share of the population.

It is no surprise, then, that the Four Tigers are forecasted to grow much more slowly in the future. Although these countries start with somewhat more favorable education and life expectancy indicators, their dramatically higher initial income levels suggest that the rates of return on new investment will steadily decline during the next thirty years, leading to slower income growth. In addition, a larger share of their populations will reach retirement age, further slowing growth. Our rough projections suggest that per capita income growth in the Four Tigers will slow to an average of about 2.8 percent per year on average, down from the 6.6 percent recorded between 1965-95. The projected slowdown in growth is similar to the pattern displayed by Japan in recent decades, when its per capita growth rate declined from an annual average of 9 percent during the 1960s to 3.5 percent in the 1980s. The convergence effect is most visible for Hong Kong and Singapore, which have the highest per capita incomes in 1995. The growth rates are projected to decline less in Korea and Taiwan, both because of the dramatic improvements in their education, life expectancy and policy variables since 1965, and because they still have lower income (and thus more room for economic catch-up) than Singapore and Hong Kong.

In Indonesia, Malaysia, and Thailand, growth rates are projected to remain roughly the same as they were in the recent past. In this case, the positive impact of improved initial conditions and better policies are basically offset by the convergence impact of higher income, with little change in aggregate growth rates.

In the PRC, the Philippines and much of South Asia, however, improved initial conditions and better economic policies dominate the convergence effect. South Asian countries should receive an additional boost from demographic trends which are leading to a rising proportion of the

working-aged in the overall population. Of course, more rapid growth will not come automatically in South Asia and other countries that currently lag. In South Asia, and in other places where the reform process is relatively new, sustained growth will require further progress on trade liberalization, market opening, and institutional upgrading. In the absence of continued reform, future growth is likely to be slower than these projections suggest.

These projections imply that Asian countries are likely to continue, and in some cases accelerate, the process of catching up with the world's economic leaders. To illustrate, we compare the projected levels of GDP per capita in 2025 for each of the Asian countries (derived from our baseline projections) with a projected level of per capita income in the United States in 2025. Based on our model , we estimate that the United Sates is likely to grow at around 1.55 percent, slightly slower than the 1.76 annual rate achieved between 1965-95 (the main reason for the slowdown is the continued aging of society in the United States, which implies a larger (and longer living) retired population, which is likely to reduce saving rates and slow growth slightly).

The results suggest that the Four Tigers will largely complete the catch-up phase of development, and join the ranks of the world's economic leaders. Our projections imply that GDP per capita in the city states of Hong Kong and Singapore will be the equivalent of about 117% and 107% of U.S. GDP per capita in 2025, slightly surpassing the U.S. average. This level of income would be consistent with many large modern cities in industrialized countries. Taiwan and Korea will be much closer to, but still slightly below, parity with average U.S. income. Malaysia's expected rapid growth, albeit perhaps slightly slower than in the past, will bring its income from its current level of 37% of U.S. income to about 70% in 2025. This is approximately equal to the 1995 average for the Four Tigers. China, Thailand, Indonesia, and the Philippines are likely to reach the equivalent of between one-fourth and one-half of average U.S. income. India and Sri Lanka are likely to jump from about 10% to 25% of U.S. income, while Pakistan and Bangladesh should be able to grow to around 18% of the U.S. level.

With these forecasts, Asia's share of world GDP is likely to grow substantially to 57% from its current level of about 35%. Thus, Asia will continue a remarkable economic transformation that has stretched over the last 200 years or more, since the dawn of the industrial revolution. In 1820, at the beginning of the industrial age, Asia made up about 58% of world GDP, according to estimates compiled by Angus Maddison (1995). This share fell sharply during the next century to only 27% in 1920, and plunged further to a mere 19% in 1950, following the world depression and the ravages of World War II. This was a very small share, considering that Asians accounted for 60% of world population at the time. Thus, if our forecasts are reasonably correct, Asia's share of world GDP will have increased from 19% in 1950 to 57% by 2025, an astounding 38 percentage point increase in just 75 years, returning the region back almost exactly to its share in 1820.

These baseline projections assume no further improvements in policies after 1995. With additional policy reforms, the South and Southeast Asian countries can achieve even higher growth rates. The penultimate column of the table provides a set of growth projections which

assume an *improved* policy stance. For illustrative purposes, we assume that all Asian countries adopt the 1995 policies of the Four Tigers, including a higher government savings rate, improved institutional quality, and increased openness. In each country, the projected growth rates accelerate markedly. This scenario is obviously very optimistic, and can be thought of as a "best case" situation, but it illustrates the upside potential from continuing the process of economic reform.

Of course, such an optimistic forecast is not the only possibility. Asia's rapid growth could be derailed by a turn toward protectionist policies around the world and a reduction in the growth of world trade. Similarly, if Asia follows the path of much of Europe and the United States towards higher government spending and social welfare programs, growth would slow. Alternatively, reforms could be derailed in China or India by political upheaval or tensions from growing divergences in incomes in some regions. A pessimistic scenario for the future would therefore include a reduction in economic openness and a fall in government saving. If, for instance, the average level of openness in Asia halved and the average rate of government saving fell by 5 percentage points of GDP, future growth rates in almost all Asian countries would be lower than those recorded during the last quarter century. The only exception might be in South Asia, where the effects of the continuing demographic transition are likely to provide a boost to growth per person. But even here, as we have pointed out, future growth will depend on the continuation of current reform programs.

Such an inward turn with slower growth is not only feasible, but has several precedents in world history. Latin America's growth, for instance, was long interrupted by fiscal mismanagement and inward-looking industrial policies. Economic growth around the world stagnated with the collapse in world trade during the Great Depression in the 1930s. Clearly, continued rapid growth in Asia is no certainty, especially if there is a serious deterioration in the conditions of the world trading system.

VIII. Conclusions

Asia's episode of rapid economic growth since the 1960s, as remarkable as it was by historical standards, can be explained in an international comparative context. Special theories of Asian growth are not necessary. East Asian countries grew faster than the rest of the world for four key reasons: they had substantial potential for catching up (since the entered the 1960s with relatively low incomes), their geography and structural characteristics were by-and-large favorable, demographic changes following World War II worked in favor of more rapid growth, and their economic policies and strategy were conducive to sustained growth. Most importantly, the high-performing East Asian countries recognized the imperative of joining the world economy through the promotion of labor-intensive manufactured exports. These economies promoted exports through a combination of policies -- relatively free trade, convertible currencies, macroeconomic stability -- and through a set of innovative institutions -- such as export processing zones, duty exemption schemes, and incentive packages for foreign direct investment.

In essence, East Asia took advantage of key opportunities that other countries either neglected or rejected. Developing countries in South Asia, Africa, and Latin America could have followed the same basic strategy as East Asia in the early 1960s, but instead they chose to turn away from international trade, protect domestic industries from international competition, and follow more profligate fiscal policies. The results were little or no growth, stagnant wages, and continued widespread poverty.

Of course, export-led growth is only part of the story. Rapid growth in East Asia was also supported by key demographic developments, favorable trends in literacy and education, public health policies which raised life expectancy, government attention to the agricultural sector, high levels of budgetary saving, and the protection of private property rights. Even salutary geographic considerations, such as favorable natural harbors and proximity to major sea lanes have played a role. Quantitatively, however, it seems clear that economic institutions and policies have been the most important factors differentiating the performance of fast-growing and slow-growing nations.

These findings have profound implications for the next thirty years. For the fast-growing countries of East Asia, there is a continuing opportunity for rapid growth, though at rates that are likely to be somewhat slower than in the past, precisely because the process of catching up has been so successful to date. Yet future growth will require successful institutional adaptations to new challenges, including: an aging population; increasing urbanization and political participation; and pressures related to increasing integration of the world economy. As a result, these countries will face increased stresses on public-sector budgets, pressures for continued reforms of the legal system, and the need for flexibility and adjustment of political institutions, including the allocation of powers between central and local governments. For countries that grew more slowly during the past thirty years, the main message is that faster growth is possible, and indeed likely, as these countries adopt market-based strategies and increased openness to world markets. South Asia has the opportunity for the kind of dynamism displayed previously in East Asia. However, such good performance will depend on continued institutional and policy reforms in trade, the budget, health and education.

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Table 1. Summary of Key Variables by Region (Unweighted averages)

	All Countries (N = 78)	Four Tigers (N = 4)	South Asia (N=4)	Southeast Asia (N=4)	Sub-Saharan Africa (N=17)	Latin America (N=21)
Growth rate of per capita GDP (1965-90, %) [(a)]	1.9	6.7	1.7	3.8	0.6	0.8
Initial conditions						
Real GDP per capita in 1965 (1985 prices, '000) [(a)]	3,163	2,010	996	1,161	826	2,611
Average Years of Secondary Schooling in 1965	0.8	1.5	0.5	0.5	0.2	0.6
Resources and Geography						
Natural Resource Intensity (primary exports/GDP, 1971)	0.11	0.01	0.05	0.17	0.16	0.16
Tropics	0.53	0.63	0.40	1	0.91	0.79
Landlocked	0.17	0	0	0	0.47	0.10
Coastline distance/land area	0.29	2.83	0.07	0.43	0.02	0.17
Policy and Choice Variables						
Openness (0 to 1; 1 = most open) [(b)]	0.43	0.97	0.06	0.73	0.08	0.17
Government Savings Rate (% of GDP)	1.6	5.6	1.0	3.5	3.0	1.2
Quality of Institutions (1 to 10; 10=best) [(c)]	5.99	7.79	4.23	4.95	4.72	4.37
Demography						
Life Expectancy in 1965 (years)	57	63	49	52	41	56
Growth of Working Age Population (annual avg., 1965-90, %)	2.23	2.68	2.51	2.90	2.85	2.60
Growth of Total Population (annual avg., 1965-90, %)	1.96	1.68	2.26	2.35	2.92	2.20

Notes: (a) GDP growth rates and levels are on a purchasing power parity basis, and are taken from the Penn World Tables version 5.6.

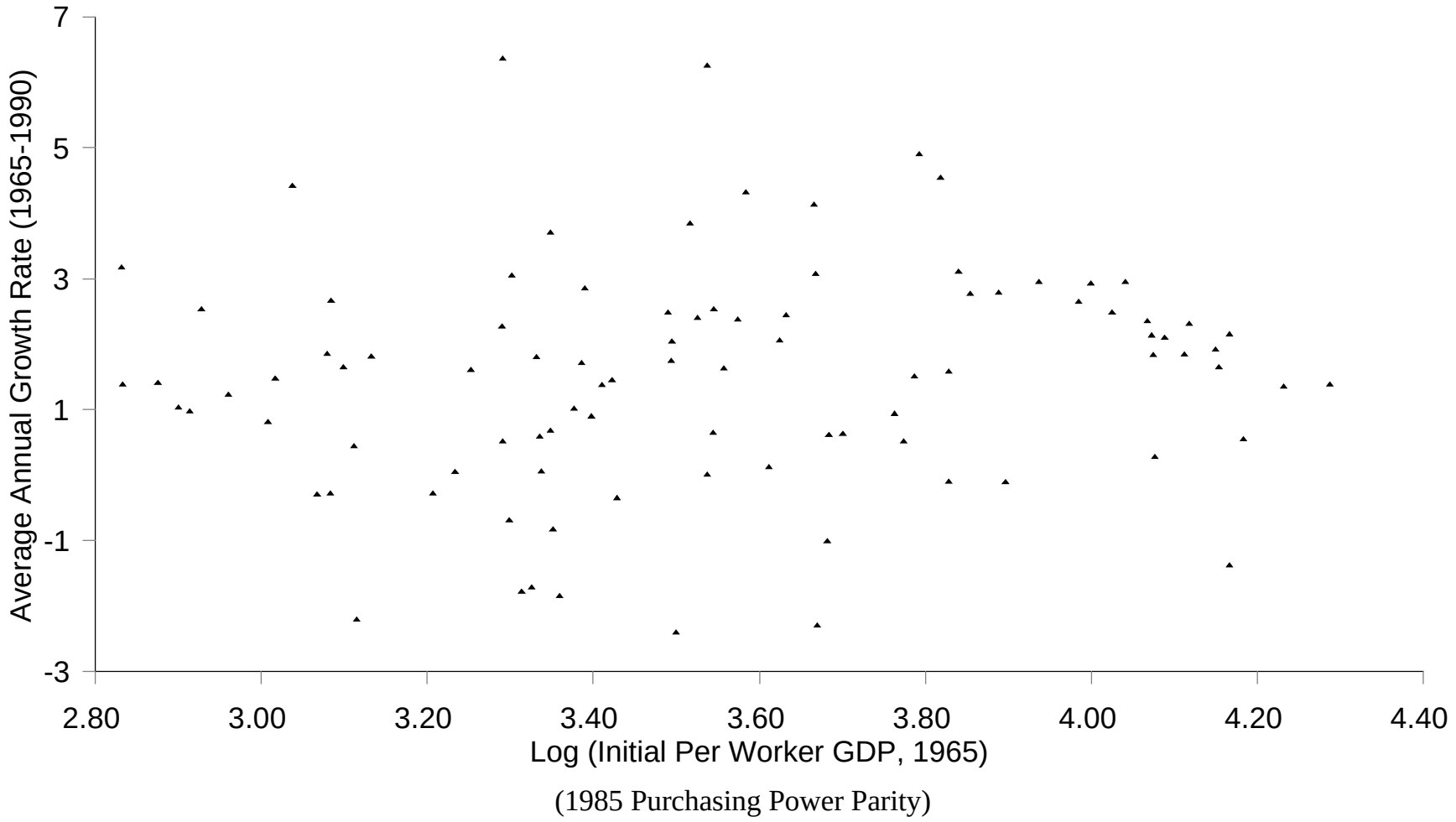
(b) The openness index is the share of years between 1965-90 that a country is considered to be open to world markets. To be considered open in any year, average tariffs must be lower than 40 percent; quotas and licensing must cover less than 40 percent of total imports; the black market premium must be less than 20 percent; and export taxes must be moderate.

(c) The institutional quality index was created by Knack and Keefer (1995), and is the average of five indicators of quality in (i) government bureaucracy, (ii) corruption (iii) rule of law, (iv) expropriation risk, and (v) repudiation of contracts by government.

Figure 1.

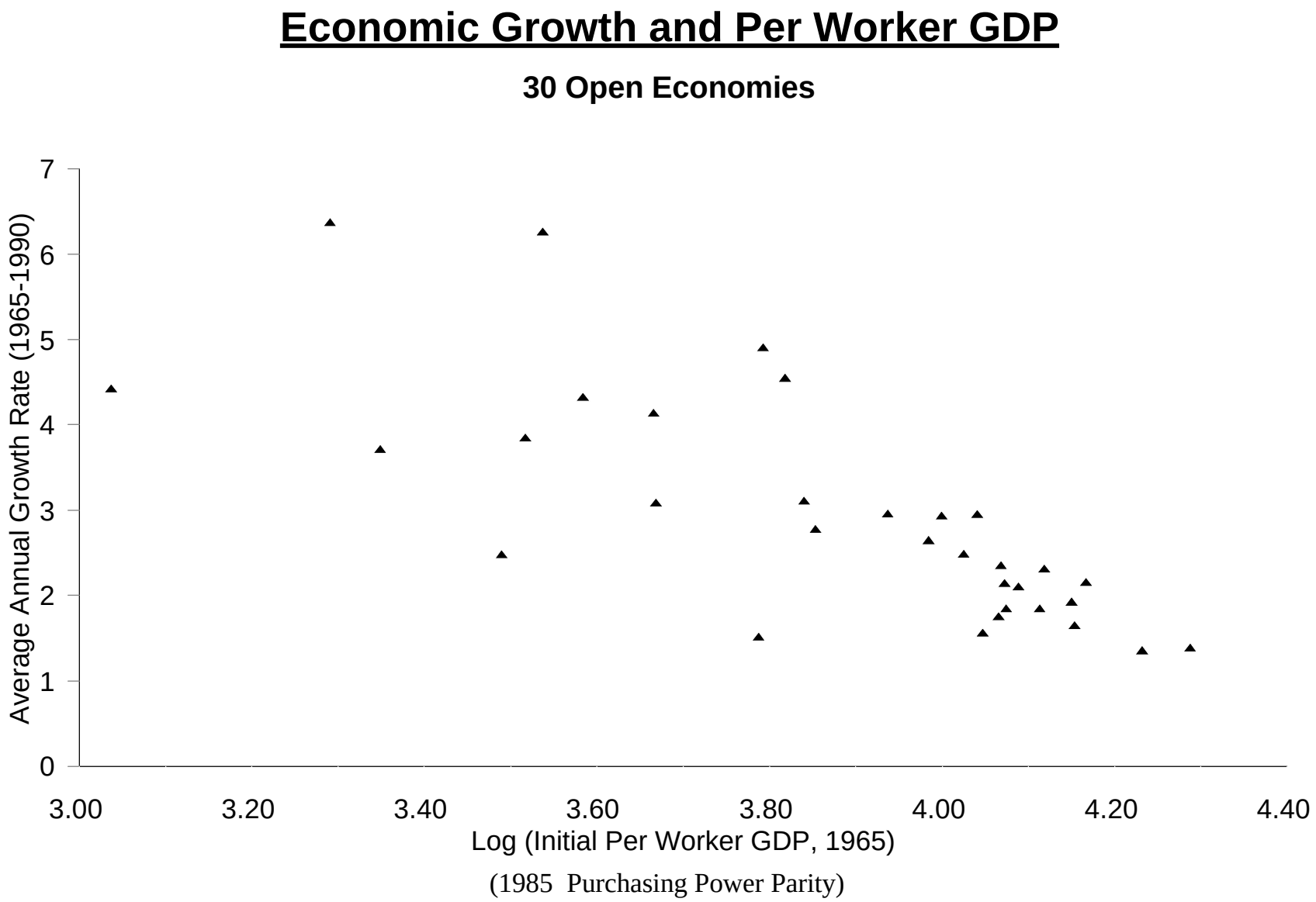
Economic Growth and Per Worker GDP

94 Countries



Source: Penn World Tables v. 5.6

Figure 2.



Source: Penn World Tables v. 5.6

Figure 3. Japan's Relative Income level and Growth Rate

5 year averages, 1960-94

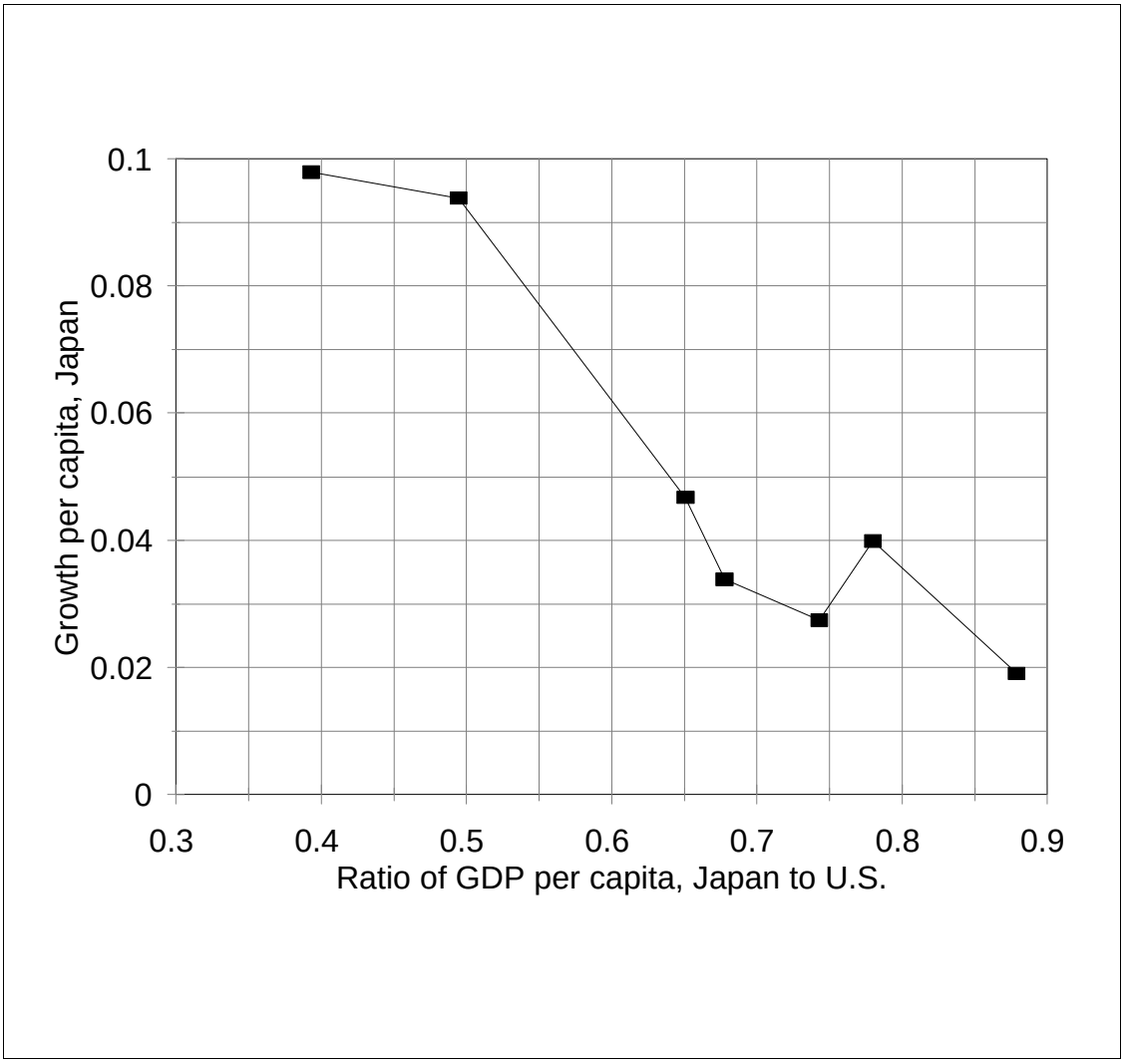


Table 2. Open Economies and Convergence

	GDP per capita relative to the U.S.	
	1965	1990
Industrialized Countries		
Australia	0.76	0.80
Austria	0.53	0.70
Belgium	0.58	0.73
Canada	0.74	0.95
Denmark	0.72	0.77
Finland	0.56	0.78
France	0.63	0.77
Germany (West)	0.68	0.79
Italy	0.49	0.69
Japan	0.38	0.79
Luxembourg	0.74	0.90
Netherlands	0.63	0.72
Norway	0.60	0.83
Spain	0.39	0.53
Sweden	0.81	0.82
Switzerland	0.96	0.91
United Kingdom	0.66	0.73
United States	1.00	1.00
Asian Low/Middle Income Countries*		
Hong Kong	0.30	0.82
Indonesia	0.05	0.11
Korea	0.09	0.37
Malaysia	0.14	0.28
Singapore	0.16	0.65
Taipei,China	0.14	0.45
Thailand	0.10	0.20
Non-Asian Low/Middle Income Countries*		
Barbados	0.28	0.40
Cyprus	0.24	0.46
Greece	0.26	0.37
Ireland	0.34	0.51
Jordan	0.14	0.16
Mauritius	0.27	0.32
Portugal	0.21	0.41

Note: Low/middle income countries are those with 1965 per capita income of $4000 or less (in 1985 PPP prices)
(openness value > 0.8 on 0-1 scale)

Figure 4. Natural Resource Abundance and Economic Growth

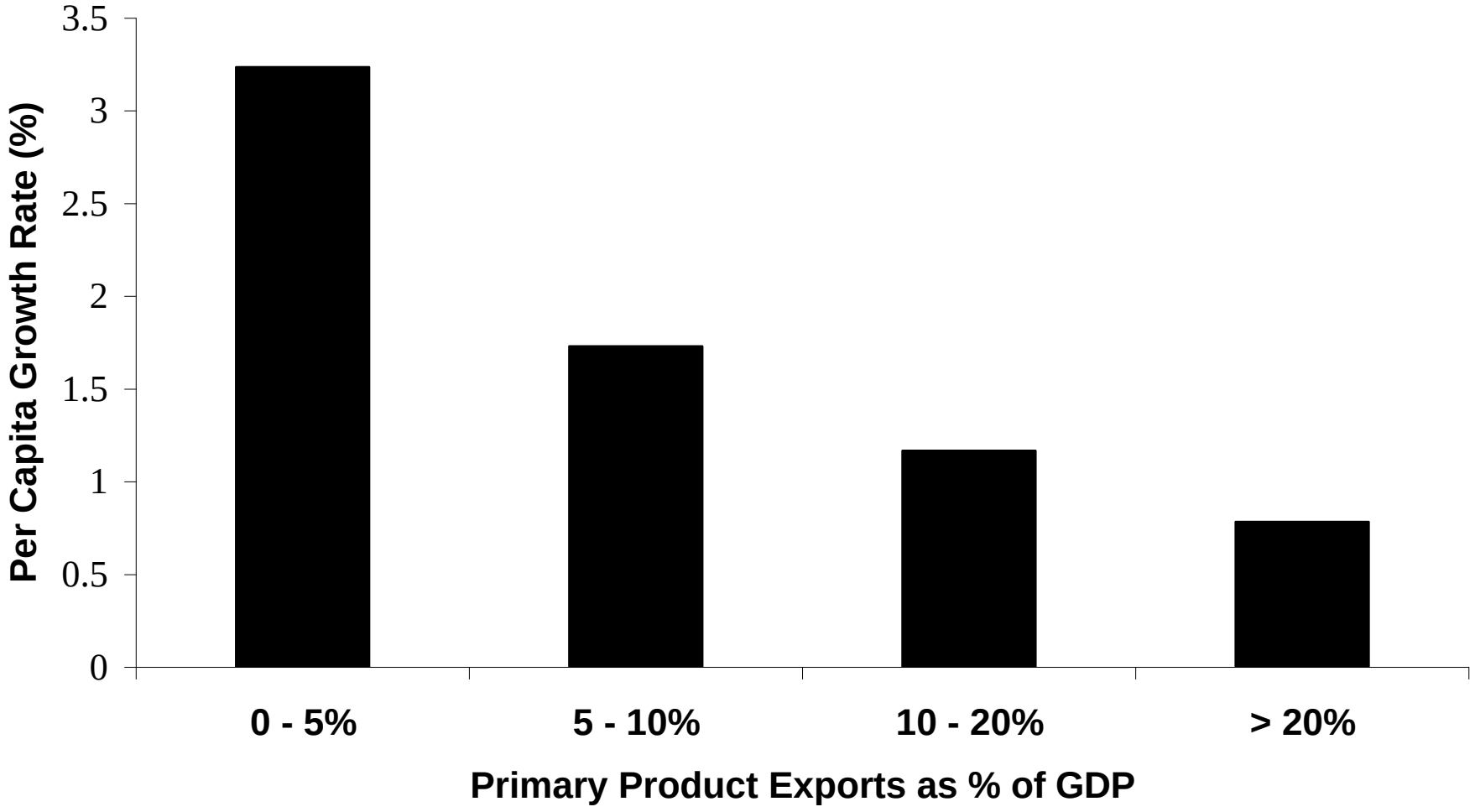


Table 3a. Cross Country Growth Regressions, Base Specification

Dependent Variable: Growth of real per capita GDP, 1965-90 (78 countries)

Independent Variable	Coefficients (t-statistics)		
Initial Output per worker (log)	-1.978 (-9.42)	-1.975 (-8.78)	-2.137 (-8.34)
Schooling (log)	0.208 (1.53)	0.200 (1.43)	0.205 (1.43)
Natural Resource Abundance	-2.430 (-2.36)	-2.439 (-2.31)	-2.217 (-2.04)
Landlocked	-0.605 (-2.28)	-0.613 (-2.27)	-0.548 (-2.01)
Tropics	-1.263 (-4.29)	-1.337 (-4.42)	-1.118 (-3.03)
Coast / Land area	0.262 (2.37)	0.249 (2.18)	0.269 (2.30)
Government Savings Rate	0.123 (4.94)	0.122 (4.81)	0.123 (4.83)
Openness	1.965 (6.20)	1.871 (5.61)	1.669 (4.58)
Quality of Institutions	0.248 (3.47)	0.238 (3.28)	0.285 (3.22)
Life Expectancy	0.336 (2.81)	0.329 (2.72)	0.313 (2.55)
Life Expectancy Squared	-0.002 (-2.23)	-0.002 (-2.14)	-0.002 (-2.01)
Growth of Working Age Population	1.129 (2.86)	1.082 (2.61)	0.977 (2.20)
Growth of Total Population	-0.774 (-1.83)	-0.731 (-1.64)	-0.596 (-1.22)
East/Southeast Asia		0.197 (0.51)	-0.209 (-0.42)
South Asia		-0.395 (-0.95)	-0.824 (-1.58)
Latin America			-0.348 (-0.82)
Sub-Saharan Africa			-0.840 (-1.59)
Adjusted R^2	**0.87**	**0.86**	**0.86**

Note: Constant term not reported.

Table 3b. Cross Country Growth Regressions, Smaller Sample Size

Dependent Variable: Growth of real per capita GDP, 1965-90

Independent Variable	Coefficients (t-statistics)	
	Dropping every 4th Observation	*Dropping Asia*
Initial Output per worker (log)	-1.964 (-8.18)	-1.894 (-6.94)
Schooling (log)	0.091 (0.47)	0.213 (1.30)
Natural Resource Abundance	-1.779 (-1.53)	-2.966 (-2.45)
Landlocked	-0.889 (-2.71)	-0.485 (-1.69)
Tropics	-1.333 (-3.56)	-1.359 (-3.62)
Coast / Land area	0.393 (1.52)	0.548 (1.24)
Government Savings Rate	0.098 (3.11)	0.120 (4.20)
Openness	1.962 (5.25)	1.335 (3.27)
Quality of Institutions	0.323 (3.62)	0.274 (3.29)
Life Expectancy	0.365 (2.65)	0.321 (2.50)
Life Expectancy Squared	-0.003 (-2.07)	-0.002 (-1.94)
Growth of Working Age Population	1.090 (2.29)	0.899 (1.89)
Growth of Total Population	-0.530 (-1.07)	-0.538 (-1.05)
Number of Countries	**59**	**64**
Adjusted R^2	**0.86**	**0.78**

Note: Constant term not reported.

Table 3c. Cross Country Growth Regressions, Variations on Education and Government Savings

Dependent Variable: Growth of real per capita GDP, 1965-90

Independent Variable	**Coefficients (t-statistics)**			
Initial Output per worker (log)	-1.890 (-9.06)	-1.669 (-6.60)	-1.913 (-7.64)	-2.005 (-8.38)
Secondary Schooling Years (log)			-0.088 (-0.61)	0.022 (0.15)
Primary Schooling Ratio (log)	0.392 (0.94)			
Adult Illiteracy Rate (log)		0.463 (1.91)		
Natural Resource Abundance	-2.184 (-2.13)	-1.820 (-1.54)	0.376 (0.30)	-2.794 (-2.02)
Landlocked	-0.702 (-2.68)	-0.652 (-1.91)	-0.771 (-2.51)	-0.570 (-1.89)
Tropics	-1.310 (-4.43)	-1.299 (-3.87)	-1.702 (-4.82)	-1.641 (-4.73)
Coast / Land area	0.293 (2.67)	0.148 (1.08)	0.686 (2.63)	0.534 (2.11)
Government Savings Rate	0.112 (4.75)	0.113 (4.18)		
Government Consumption			-3.192 (-1.36)	
Total Government Expenditures				0.960 (0.89)
Openness	2.026 (6.35)	2.236 (6.15)	2.18 (5.87)	2.601 (6.72)
Quality of Institutions	0.266 (3.67)	0.282 (3.18)	0.317 (3.87)	0.274 (3.48)
Life Expectancy	0.272 (1.77)	0.265 (1.81)	0.273 (1.94)	0.350 (2.58)
Life Expectancy Squared	-0.002 (-1.44)	-0.002 (-1.08)	-0.002 (-1.49)	-0.003 (-2.16)
Growth of Working Age Population	1.220 (3.09)	1.448 (3.00)	1.414 (3.06)	1.446 (3.37)
Growth of Total Population	-0.849 (-1.99)	-1.122 (-2.19)	-0.877 (-1.71)	-0.783 (-1.64)
Number of Countries	**77**	**60**	**76**	**73**
Adjusted R^2	**0.86**	**0.86**	**0.80**	**0.83**

Note: Constant term not reported.

Table 3d. Cross Country Growth Regressions, OLS and IV

Dependent Variable: Growth of real per capita GDP, 1965-90

Independent Variable	Coefficients (t-statistics)			
	Ordinary Least Squares		*Instrumental Variables*	
	I	*II*	*III*	*IV*
Initial Output per worker (log)	-1.915 (-8.59)	-1.794 (-7.20)	-1.947 (-7.58)	-1.750 (-7.69)
Secondary Schooling Years (log)	-0.065 (-0.50)	-0.054 (-0.39)	-0.025 (-0.17)	0.045 (0.35)
Natural Resource Abundance	-1.887 (-1.72)	-1.148 (-0.96)	-1.905 (-1.62)	-4.261 (-3.37)
Landlocked	-0.722 (-2.62)	-0.721 (-2.45)	-0.674 (-2.23)	-0.869 (-3.24)
Tropics	-1.623 (-5.20)	-1.500 (-4.35)	-1.697 (-4.72)	-1.130 (-3.23)
Coast / Land area	0.441 (3.71)	0.536 (2.00)	0.535 (2.04)	0.355 (1.51)
National Savings Rate (including transfers)	0.044 (2.81)		0.025 (0.50)	0.059 (2.17)
Investment Rate		4.419 (1.81)		
Openness	2.41 (6.48)	2.012 (5.54)	2.122 (4.99)	1.945 (5.20)
Quality of Institutions	0.217 (2.80)	0.253 (3.09)	0.233 (2.76)	0.145 (1.97)
Life Expectancy	0.212 (1.61)	0.259 (1.87)		
Life Expectancy Squared	-0.001 (-1.25)	-0.002 (-1.51)		
Log of Life Expectancy			3.103 (2.21)	2.250 (2.06)
Growth of Working Age Population	1.340 (3.33)	1.434 (3.21)	1.677 (3.54)	1.447 (3.93)
Growth of Total Population	-0.751 (-1.67)	-1.032 (-2.17)	-1.031 (-2.11)	-1.042 (-2.47)
Number of Countries	**76**	**79**	**68**	**66**
Adjusted R^2	**0.86**	**0.80**	**0.84**	**0.86**

Note: 1.Constant term not reported. 2. Instrumental Variable Regression *III* uses Young-Age Dependency Ratio, Old-Age Dependency Ratio, Social Security Expenditure and Government Savings Rate as instruments for National Savings Rate. Regression *IV* uses Young-Age Dependency Ratio, Old-Age Dependency Ratio, Social Security Expenditure, Government Savings Rate, Credit to Public Sector, Money Supply (M2) and Inflation Threshold as instruments for National Savings Rate.

Table 3e. Cross Country Growth Regressions, Additional Variables

Dependent Variable: Growth of real per capita GDP, 1965-90*

Independent Variable	Coefficients (t-statistics) I	II	III	IV	V*
Initial Output per worker (log)*	-1.974 (-9.25)	-2.316 (-6.95)	-1.976 (-8.63)	-2.036 (-9.36)	-1.577 (-7.11)
Secondary Schooling (log)	0.175 (1.24)	0.098 (0.48)	0.156 (1.13)	0.226 (1.65)	0.139 (0.72)
Natural Resource Abundance	-2.524 (-2.36)	-1.73 (-1.29)	-2.668 (-2.49)	-2.611 (-2.49)	-2.580 (-1.69)
Landlocked	-0.663 (-2.44)	-1.806 (-1.89)	-0.616 (-2.27)	-0.634 (-2.30)	-0.121 (-0.31)
Tropics	-1.254 (-4.23)	-1.008 (-2.42)	-1.229 (-4.01)	-1.361 (-4.54)	-1.512 (-3.33)
Coast / Land area	0.262 (2.35)	0.288 (2.54)	0.273 (2.47)	0.435 (1.89)	0.605 (1.85)
Government Savings Rate	0.131 (4.95)	0.119 (2.96)	0.128 (4.70)	0.129 (5.02)	0.132 (3.35)
Openness	2.019 (6.22)	2.085 (4.40)	1.885 (5.57)	1.995 (6.32)	2.499 (5.11)
Quality of Institutions	0.244 (3.18)	0.539 (4.56)	0.273 (2.72)	0.210 (2.81)	0.474 (4.20)
Life Expectancy	0.307 (2.49)	0.541 (3.27)	0.329 (2.65)	0.350 (2.92)	0.467 (2.60)
Life Expectancy Squared	-0.002 (-1.94)	-0.005 (-2.91)	-0.002 (-2.10)	-0.003 (-2.38)	-0.004 (-2.24)
Growth of Working Age Population	1.140 (2.84)	0.285 (0.49)	1.056 (2.60)	0.988 (2.49)	0.325 (0.50)
Growth of Total Population	-0.783 (-1.83)	0.093 (0.14)	-0.721 (-1.69)	-0.627 (-1.23)	0.067 (0.10)
Inflation	0.301 (0.48)				
Initial Gini Coefficient		0.020 (1.20)			
Political Instability			0.471 (0.38)		
Political Rights				-0.087 (-1.23)	
Number of Countries	**77**	**47**	**74**	**76**	**73**
Adjusted R^2	**0.86**	**0.88**	**0.87**	**0.86**	**0.78**

Notes: 1.Constant term not reported. 2. In column 5, both the growth rate of real per capita GDP and initial output per worker are based on data from the World Bank rather than the Penn World Tables.

Table 4. Contributions to Growth Differentials Between East/Southeast Asia and Various Regions, 1965-90 (percent, annual average)

	Contribution of each variable to the difference in per capita growth relative to East/Southeast Asia		
	South Asia	**Sub-Saharan Africa**	**Latin America**
Initial Conditions	0.3	0.7	-1.2
Initial GDP per capita	0.5	1.0	-1.2
Schooling	-0.2	-0.4	-0.1
Resources and Geography	0.2	-1.0	-0.6
Natural Resources	0.1	-0.2	-0.2
Landlocked	0.0	-0.3	-0.1
Tropics	0.5	-0.2	-0.0
Coastline/land area	-0.3	-0.3	-0.3
Policy Variables	-2.1	-1.7	-1.8
Government Savings Rate	-0.4	-0.1	-0.3
Openness	-1.2	-1.2	-1.0
Institutions	-0.5	-0.4	-0.5
Demography	-0.9	-1.9	-0.2
Life Expectancy	-0.5	-1.3	0.1
Growth in working age population	-0.3	0.1	-0.2
Growth in total population	-0.2	-0.7	-0.1
Difference in:			
Predicted Growth	-2.5	-3.9	-3.8
Actual Growth	-2.9	-4.0	-3.9

Note: The ten economies in our sample from the East/Southeast Asia region are Hong Kong, PRC, Singapore, Korea, Taipei,China, Thailand, Malaysia, Indonesia, the Philippines, and Papua New Guinea.

Table 5a. Differences Between Asia and the World, 1969-71

Variables	Number of Countries	**Four Tigers**	**Southeast Asia**	**South Asia**
Exports/GDP	77	+*	+***	
Manufacturing Exports	71	+*		
Net Primary Exports	72	-**		
Imports/GDP	77	+*		
Resource Balance	77			
Investment/GDP	77	+***		
Domestic Savings/GDP	77			
National Savings/GNP	77			
Agriculture/GDP, value added	67			+*
Industry/GDP, value added	66			-**
Manufacturing/GDP, value added	63			-***
Services/GDP, value added	66			
Government Total Expenditures[1]	69			
Government Current Expenditures[1]	64			
Social Security Expenditures[1]	59	-*	-***	
Tax Revenue (%GDP) [1]	68			
Central Government Balance[1]	64	+****		
Primary Schooling Enrollment	73			
Secondary Schooling Enrollment	72		+**	+***
Secondary Years of Schooling	69	+*		+***
Total Years of Schooling	68		+**	
Literacy Rate	64		+***	
Life Expectancy	77			
Urbanization	77	+*		

1. These budgetary variables are for year 1974-76 due to missing data problems.

Note: A + (-) sign in a cell indicates that the average for the sub-region was statistically significantly higher (lower) than that of the other countries, after controlling for several structural variables. These include log of gdp, log of gdp squared, log of population, log of population squared, log of land per person, log of shiping cost, lower & upper dependency ratios.

Levels of significance:

* 1% ** 5% *** 10%

Table 5b. Differences Between Asia and the World, 1989-91

Variables	Number of Countries	**Four Tigers**	**Southeast Asia**	**South Asia**
Exports/GDP	76	+*	+*	
Manufacturing Exports	73	+*	+*	
Net Primary Exports	63			
Imports/GDP	76	+*	+*	
Resource Balance	76	-***		
Investment/GDP	76	+**	+*	-***
Domestic Savings/GDP	76	+*	+*	-**
National Savings/GNP	76	+***	+**	
Agriculture/GDP, value added	69			+*
Industry/GDP, value added	69			-**
Manufacturing/GDP, value added	65			-*
Services/GDP, value added	69			
Government Total Expenditures	62			
Government Current Expenditures	59			
Social Security Expenditures	47	-**		
Tax Revenue (%GDP)	62			
Central Government Balance	59		+***	
Primary Schooling Enrollment	72			
Secondary Schooling Enrollment	66			
Secondary Years of Schooling	68	+*		+**
Total Years of Schooling	68			
Literacy Rate	76			-***
Life Expectancy	73			

Note: A + (-) sign in a cell indicates that the average for the sub-region was statistically significantly higher (lower) than that of the other countries, after controlling for several structural variables. These include log of gdp, log of gdp squared, log of population, log of population squared, log of land per person, log of shiping cost, lower & upper dependency ratios.

Levels of significance:

* 1%

** 5%

*** 10%

Urbanization	76		-**	-***

Note: A + (-) sign in a cell indicates that the average for the sub-region was statistically significantly higher (lower) than that of the other countries, after controlling for several structural variables. These include log of gdp, log of gdp squared, log of population, log of population squared, log of land per person, log of shiping cost, lower & upper dependency ratios.

Levels of significance:

*	1%
**	5%
***	10%

Table 6. Manufactured Exports and Economic Growth

		GDP per capita growth, 1970-90		
		Growth > 3%	Growth < 3%	Total
Weighted Non-Resource Based Manufactured Export Growth	Growth >1%	China, Hong Kong, Ireland, Korea, Mauritius, Malaysia, Portugal, Singapore, Taiwan, Thailand, Tunisia	Israel	N = 12
	Growth <1%	Indonesia, Jordan	64 countries	N = 66
	Total	N = 13	N = 65	N = 78

Notes: Includes 78 countries with 1994 population greater than 1 million and GNP per capita of less than $15,000 (or PPP-adjusted income of less than 16,000). The weighted non-resource based manufactured exports growth rate is equal to the annual growth rate of those exports times their share in GDP. Pearson chi-squared statistic = 53.82, with probability = 0.000.

Table 7. Manufactured Export Growth Regressions

Dependent Variable: Weighted growth rate of non-resource based manufactured exports 1970-90 (weights equal to the share of these exports in GDP in the previous year).
Sample: 65 countries

Independent Variables	(1)	(2)	(3)	(4)
Openness	0.70 (2.65)	0.68 (2.47)	0.61 (2.02)	0.72 (2.22)
Land per person (log)	-0.19 (-2.61)	-0.19 (-2.63)	-0.25 (-2.84)	-0.16 (-1.92)
Shipping Cost (log)	-0.31 (-2.50)	-0.29 (-2.26)	-0.27 (-1.99)	-0.34 (-2.38)
Quality of Institutions	0.11 (2.06)	0.11 (1.69)	0.11 (1.72)	0.09 (1.45)
Gross Domestic Product (1970)	-0.98 (-3.64)	-0.98 (-3.55)	-0.97 (-3.35)	-1.02 (-3.53)
Government Consumption/GDP		-0.01 (-0.58)		
Life Expectancy (log, 1970)		0.01 (0.43)		
Schooling (log, 1970)			0.13 (1.02)	
Investment/GDP			-0.01 (-0.30)	
Southeast Asia				-0.15 (-0.37)
South Asia				0.10 (0.22)
Latin America				-0.20 (-0.75)
Sub-Saharan Africa				-0.04 (-0.12)
Adjusted R^2	0.63	0.62	0.61	0.61

Note: Constant terms not reported. T-statistics are in parenthesis.

Table 8a. Composition of Exports in 1970.

	Primary	Manufactures							
Country		Textiles	*Other Labor Intensive*	*Electronics*	*Machinery*	*Scale Intensive*	*Other Human Capital intensive*	*Other Manufactures*	***Total Manufactures***
Bangladesh /1	**55.4**	43.0	0.0	0.1	0.0	0.7	0.5	0.3	**44.6**
Hong Kong	**4.8**	10.4	49.8	10.5	0.8	1.3	8.0	14.5	**95.2**
India	**58.2**	22.9	3.0	1.1	1.8	9.1	3.1	1.2	**41.8**
Indonesia	**98.6**	0.2	0.0	0.0	0.0	0.0	0.3	0.7	**1.3**
Korea, Rep.	**35.2**	10.6	29.0	5.3	1.0	3.5	1.7	13.8	**64.8**
Malaysia	**94.7**	0.4	0.5	0.3	0.7	1.4	0.8	1.2	**5.3**
Myanmar (Burma)	**99.9**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.1**
Pakistan	**47.8**	46.1	2.6	0.2	0.2	0.3	0.9	2.0	**52.2**
Philippines	**96.8**	0.5	0.4	0.0	0.1	1.4	0.2	0.7	**3.2**
Singapore	**71.2**	3.5	3.3	4.0	4.0	5.3	3.4	5.3	**28.8**
Sri Lanka	**99.0**	0.0	0.5	0.0	0.0	0.1	0.3	0.0	**1.0**
Thailand	**94.0**	1.2	0.2	0.1	0.0	0.4	0.5	3.5	**6.0**
Fiji	**98.3**	0.0	0.3	0.0	0.0	0.6	0.5	0.3	**1.7**
Papua New Guinea/2	**99.2**	0.0	0.0	0.0	0.0	0.0	0.2	0.6	**0.8**
Western Samoa	**93.5**	0.0	0.4	0.0	0.0	0.0	0.1	6.0	**6.5**

1/ Year=1977
2/ Year=1971
Note: Data are unavailable for China in 1970.
Primary exports include SITC1 categories 001-265, 267-431, 611-3, 661-3, 671, and 68.
Manufactures include SITC1 categories 266, 511-599, 621-9, 641-657, 664-6, 672-9, and 691-961.
Textiles include SITC1 categories 266 and 651-657
Other Labor Intensive include SITC1 categories 664-666, 821-851, and 893-895.
Electronics include SITC1 categories 722-729.
Machinery include SITC1 categories 711-719.
Scale Intensive include SITC1 categories 512-515, 521, 581, 621-629, 642, 671-679, and 721-735.
Other Human Capital Intensive include SITC1 categories 532, 533, 551-554, 641, 691-698, 812, 864, 891, 892, 896, 897, and 951.
Other Manufacturing include SITC1 categories 531, 541, 561, 571, 599, 861-863, 899, 911-941, and 961.

Table 8b. Composition of Exports in 1994.

	Primary	Manufactures							
Country		Textiles	*Other Labor Intensive*	*Electronics*	*Machinery*	*Scale Intensive*	*Other Human Capital intensive*	*Other Manufactures*	***Total Manufactures***
Bangladesh/1	**22.3**	14.8	58.8	0.1	0.8	0.2	0.2	2.8	**77.7**
China	**20.3**	9.7	34.9	10.4	4.2	7.2	8.4	4.8	**79.7**
Hong Kong	**5.2**	6.8	36.5	16.0	9.3	3.2	15.5	7.4	**94.8**
India	**42.0**	13.2	19.3	1.5	2.8	10.3	5.4	5.8	**58.0**
Indonesia	**60.7**	6.4	16.4	3.6	1.2	3.8	6.4	1.4	**39.3**
Korea, Rep.	**8.1**	12.0	10.2	25.6	8.9	24.4	8.1	2.7	**91.9**
Malaysia	**29.4**	1.5	6.8	32.8	11.6	6.7	8.7	2.6	**70.6**
Myanmar/2	**91.6**	0.8	3.5	0.0	0.0	0.1	1.7	2.2	**8.4**
Pakistan	**16.7**	53.1	26.6	0.0	0.1	0.2	0.6	2.6	**83.3**
Philippines	**22.6**	1.4	13.1	18.2	2.2	2.9	1.6	38.0	**77.4**
Singapore	**17.1**	1.5	3.4	28.3	29.4	6.7	8.6	5.0	**82.9**
Sri Lanka	**33.7**	4.1	52.1	1.3	0.9	2.6	1.8	3.5	**66.3**
Thailand	**31.1**	3.9	19.9	15.5	12.2	6.1	7.8	3.6	**68.9**
Fiji	**68.1**	1.2	26.5	0.6	0.1	1.5	1.3	0.6	**31.9**
Papua New Guine/1	**96.3**	0.0	0.1	0.1	1.1	2.0	0.1	0.3	**3.7**
Western Samoa/3	**96.5**	0.0	1.2	0.0	0.0	1.9	0.3	0.0	**3.5**

1/ Year=1993
2/ Year=1991
3/ Year=1990
Primary exports include SITC1 categories 001-265, 267-431, 611-3, 661-3, 671, and 68.
Manufactures include SITC1 categories 266, 511-599, 621-9, 641-657, 664-6, 672-9, and 691-961.
Textiles include SITC1 categories 266 and 651-657
Other Labor Intensive include SITC1 categories 664-666, 821-851, and 893-895.
Electronics include SITC1 categories 722-729.
Machinery include SITC1 categories 711-719.
Scale Intensive include SITC1 categories 512-515, 521, 581, 621-629, 642, 671-679, and 721-735.
Other Human Capital Intensive include SITC1 categories 532, 533, 551-554, 641, 691-698, 812, 864, 891, 892, 896, 897, and 951.
Other Manufacturing include SITC1 categories 531, 541, 561, 571, 599, 861-863, 899, 911-941, and 961.

Table 9. Location of Offshore Operations of Major Electronics Component Manufacturing Firms, 1971 and 1974.

	1971		1974	
	Firms	Employees	Firms	Employees
East/Southeast Asia	**17**	**19,600**	**51**	**77,337**
Singapore	10	7,300	12	22,400
Hong Kong	2	5,000	6	8,250
South Korea	2	4,800	7	17,300
Taiwan	3	2,500	3	5,500
Malaysia	0	0	18	17,387
Indonesia	0	0	3	2,500
Thailand	0	0	1	2,000
Philippines	0	0	1	2,000
Rest of World	**4**	**2,361**	**2**	**2,650**
Mexico	4	2,361	0	0
El Salvador	0	0	1	1,800
Mauritius	0	0	1	850
World Total	**21**	**21,961**	**53**	**79,987**

Source: International Subcontracting Arrangements in Electronics Between Developed Market Economy Countries and Developing Countries, UNCTAD TD/B/C.2/144 Supp 1, 1975.

Table 10. Radios: Price Comparison for Annual Production of 1 thousand Radio Receivers for the European Market, 1974 ($ per thousand sets)

	Manufacture in Western Europe, Source of Material: Western Europe	Manufacture in Far East, Source of Material: Far East	Manufacture in Africa , Source of Material: Western Europe	Manufacture in Africa , Source of Material: Far East
I. **Production**				
Material	7,490	6,554	7,491	6,554
Handling/freight/insurance	375	562	1,423	1,498
Duties 20%	-	-	1,783	1,610
Cost of Production	**3,552**	**1,831**	**2,151**	**2,119**
of which:				
Direct personnel	1,723	562	468	468
Indirect personnel	974	421	381	381
Expatriate personnel	-	187	262	262
Depreciation	252	104	159	159
Repair & maintenance	45	22	26	26
Utilities	22	7	7	7
Loss of material	39	43	75	68
General expenses	82	109	112	112
Interest	379	352	621	599
Insurance	35	23	39	37
Running-in expenses	562	562	562	562
Coverage for research & development	936	936	936	936
Ex-factory delivery price	**12,915**	**10,446**	**14,346**	**13,279**
II. Transport to European commercial stores				
Interest goods in transit	26	120	176	161
Handling/freight/insurance	388	818	839	828
Duties 14%	-	1,466	2,008	1,859
Price in European Market	**13,329**	**12,849**	**17,369**	**16,127**

Source: International Subcontracting Arrangements in Electronics Between Developed Market Economy Countries and Developing Countries, Unctad TD / B / C.2 / 144 Supp 1 1975.

Table 11. Tariff Rates and Quantitative Restrictions on Imported Capital Goods and Intermediate Goods.

	Tariff Rates(%)	Share of Imports Covered by Quantitative Restrictions(%)
World	**17.0**	**19.0**
Four Tigers	**5.7**	**12.0**
Hong Kong	0.0	0.0
Korea	13.7	1.0
Singapore	1.6	0.5
Taipei,China	7.3	37.5
PRC	**25.4**	**29.1**
Southeast Asia	**18.5**	**16.7**
Indonesia	13.7	10.1
Malaysia	8.7	4.5
Philippines	22.1	46.7
Thailand	29.4	5.5
South Asia	**50.5**	**31.7**
Bangladesh	40.9	49.7
India	132.0	88.8
Nepal	10.4	4.5
Pakistan	41.1	7.5
Sri Lanka	28.0	8.0
Papua New Guinea	**10.6**	**0.2**
Sub-Saharan Africa	**22.5**	**20.5**
Latin America	**19.5**	**21.8**
OECD	**3.9**	**8.8**

Source: Barro and Lee.

Table 12. Export Processing Zones (EPZs), 1990

Region/Country	Number of EPZs in Operation	Total Employment
Asia	36	377,968
Bangladesh	1	9,061
India	6	20,750
Indonesia	3	n.a.
Korea	2	23,224
Malaysia	12	104,000
Philippines	4	34,609
Sri Lanka	2	56,128
Taipei,China	3	68,196
Latin America/Caribbean	41	148,400
Europe/Middle East/North Africa	4	2,000
Sub-Saharan Africa	4	1,200
World Total	86	529,568

Source: World Bank (1992)

Table 13. U.S. Imports Under the Generalized System of Preferences (GSP), 1995

Country/Region		US imports of GSP (mil $)	GSP Imports/ Total Imports From Region (%)	Share of Total U.S. GSP Imports (%)
Southeast Asia	*Total*	***10,058.5***	**...**	***54.5***
	Average	***2,514.6***	***67.8***	**...**
Indonesia		***1,462.5***	69.7	7.9
Malaysia		***4,931.0***	67.8	26.7
Philippines		***1,270.5***	75.4	6.9
Thailand		***2,394.5***	58.1	13.0
South Asia	*Total*	***1,157.7***	**...**	***6.3***
	Average	***231.5***	***80.7***	**...**
Bangladesh		***19.3***	55.1	0.1
India		***952.3***	73.5	5.2
Nepal		***2.1***	89.8	0.0
Pakistan		***91.0***	91.1	0.5
Sri Lanka		***93.1***	93.9	0.5
Pacific Islands	*Total*	***87.9***	**...**	***0.5***
	Average	***11.0***	***73.6***	**...**
Cook Islands		***0.2***	51.4	0.0
Fiji		***5.4***	90.6	0.0
Kiribati		***0.0***	5.0	0.0
Papua New Guinea		***3.1***	99.7	0.0
Solomon Islands		***0.0***	84.7	0.0
Tokelau		***0.5***	73.2	0.0
Tonga		***78.7***	99.1	0.4
Western Samoa		***0.0***	85.6	0.0
Latin America	***Total***	***4,108.1***	**...**	***22.3***
	Average	***132.5***	***30.3***	**...**
Sub-Saharan Africa	***Total***	***488.8***	**...**	***2.7***
	Average	***10.9***	***53.0***	**...**
World	***Total***	***18,445.4***	***6.7***	***100.0***

Source: U.S. Department of Commerce

Table 14. *National, Government and Private Savings (share of GNP, annual averages)*

	National Savings				Government Savings			Private Savings		
	1965-69	1970-79	1980-89	1990-93	1970-79	1980-89	1990-93	1970-79	1980-89	1990-93
Four Tigers	***19.7***	***27.7***	***34.5***	***36.6***	***5.9***	***6.5***	***6.3***	***20.8***	***28.3***	***30.9***
Hong Kong	25.5	30.8	33.4	34.5	...	...	...	...	...	...
Korea	14.0	20.8	29.2	35.3	2.9	3.4	3.4	17.8	25.7	31.9
Singapore	16.9	28.2	41.8	47.9	7.6	10.0	10.7	20.6	31.8	37.1
Taiwan	22.4	31.2	33.6	28.7	7.3	6.1	4.9	23.9	27.5	23.8
China	***22.6***	***29.8***	***33.7***	***37.9***	***...***	***...***	***...***	***...***	***...***	***...***
Southeast Asia	***16.9***	***24.2***	***25.3***	***27.8***	***2.8***	***3.8***	***6.2***	***22.4***	***21.5***	***21.5***
Indonesia	5.2	23.2	27.0	28.0	6.6	9.4	9.7	18.5	17.6	18.3
Malaysia	22.8	27.3	29.1	30.7	1.2	2.8	6.2	27.0	26.3	24.4
Philippines	18.6	24.5	19.7	18.5	2.3	2.0	1.3	23.2	17.7	17.1
Thailand	21.1	22.0	25.4	34.0	1.2	0.9	7.4	21.0	24.5	26.3
South Asia	***9.5***	***9.3***	***11.6***	***12.3***	***0.5***	***0.5***	***-0.4***	***11.8***	***12.4***	***15.5***
Bangladesh	8.7	1.9	1.9	4.8	...	...	...	...	...	...
India	14.3	18.9	20.1	20.9	1.3	-0.3	-1.0	19.1	20.3	21.8
Myanmar (Burma)	10.4	10.2	11.7	6.9	0.7	2.4	-0.2	9.7	9.3	9.4
Nepal	2.7	8.2	11.8	11.6	...	...	...	...	...	...
Pakistan	11.2	7.3	12.6	17.4	0.4	0.1	-1.1	6.2	12.0	18.4
Sri Lanka	9.4	12.8	11.0	13.0	0.5	3.1	0.8	12.1	7.9	12.3
Pacific Islands										
Fiji	14.1	15.7	17.1	13.5	2.9	2.1	1.9	12.8	14.9	11.5
Papua New Guinea	-0.2	13.3	8.6	15.7	3.6	1.6	-0.1	13.2	7.0	15.8
Asia	***14.1***	***19.2***	***21.6***	***23.5***	***3.0***	***3.4***	***3.4***	***17.3***	***18.7***	***20.6***
Latin America	***16.2***	***18.2***	***13.2***	***10.5***	***3.0***	***-1.5***	***1.5***	***14.6***	***13.9***	***9.5***
Sub-Saharan Africa	***9.5***	***11.8***	***7.6***	***5.8***	***2.8***	***4.4***	***5.5***	***7.9***	***5.1***	***7.7***
OECD	***24.4***	***24.3***	***21.6***	***21.2***	***1.7***	***-0.9***	***-1.3***	***22.3***	***22.4***	***22.3***

Source: World Bank

Table 15. Summary of Savings Variables by Region, 1970-92

(Unweighted averages from 5-year averages panel, 72 countries)

	All Countries	East/ Southeast Asia	South Asia	Sub-Saharan Africa	Latin America	OECD
Saving Rates (% of GNP)						
Private	14.9	20.9	14.5	7.5	14.9	22.5
National	17.4	25.5	12.8	9.7	15.9	22.0
Demographic Factors						
Young-Age Dependency Ratio (%)	62.6	63.9	70.5	86.1	73.4	36.3
Old-Age Dependency Ratio (%)	10.9	6.2	6.7	5.7	7.3	19.1
Life Expectancy (years)	64.3	64.7	58.6	49.7	65.8	73.7
Government Policies						
Central Government Savings (% of GNP)	1.5	3.6	1.2	2.3	1.5	0.2
Government Social Security Expenditure (% of GNP)	5.5	0.6	2.1	0.9	3.8	11.9
Credit to the Public Sector (% of GDP)	16.3	1.5	25.0	13.5	13.9	18.6
Inflation Rate (%)	57.4	8.2	10.8	20.7	196.2	8.2
Economic Growth						
Growth in per capita income (lagged %)	1.9	4.0	1.8	1.0	1.0	2.6
Financial Sector Development						
Money Supply (M2) (% of GDP)	45.6	57.3	33.1	27.8	30.5	63.3

Sources: The World Bank, Summers and Heston, Barro and Lee

Table 16. Determinants of National Savings, Random-Effects GLS Regression

Dependent Variable: National Savings Rate, 1970-92

Independent Variable	Coefficients (t-statistics)			
	I	*II*	*III*	*Instrumental Variables **
Young Age-Dependency Ratio	-19.385 (-4.36)	-20.581 (-4.41)	-18.797 (-3.93)	-45.246 (-6.35)
Old-Age Dependency Ratio		5.101 (0.29)		
Life Expectancy	1.823 (3.24)	2.276 (3.98)	1.598 (2.66)	1.692 (5.32)
Life Expectancy-Squared	-0.013 (-2.63)	-0.018 (-3.45)	-0.012 (-2.25)	-0.018 (-4.72)
Lagged Growth Rate of per capita GDP	0.348 (3.33)	0.276 (2.56)	0.314 (2.99)	
Growth Rate of per capita GDP *				0.218 (1.72)
Government Savings Rate	0.592 (6.51)	0.562 (6.20)	0.591 (6.51)	0.433 (3.93)
Credit to Public Sector	-0.082 (-3.44)	-0.089 (-3.68)	-0.077 (-3.15)	-0.057 (-2.02)
Government Social Security Expenditure	-0.419 (-3.40)	-0.480 (-2.82)	-0.448 (-3.15)	-0.057 (-2.02)
Threshold Inflation	-2.00 (-2.35)	-1.968 (-2.26)	-1.875 (-2.13)	-2.006 (-2.00)
Money Supply (M2)	0.046 (2.25)	0.057 (2.50)	0.041 (1.90)	-0.007 (-0.26)
Urbanization		0.009 (0.27)		
Political Instability		-8.970 (-1.56)		
East/Southeast Asia			0.392 (0.18)	
South Asia			-3.971 (-1.57)	
Sub-Saharan Africa			-3.387 (-1.49)	
Latin America			-1.341 (-0.71)	
Number of Observations	**285**	**269**	**285**	**250**
Number of Countries	**75**	**71**	**75**	**64**
Adjusted R^2	**.64**	**.65**	**.65**	**.53**

Note: 1.Constant term not reported. 2. * Instrumental Variable Regression uses all the Independent Variables from the Regression in Table3a, Column 1, as instruments for the Growth Rate of per capita GDP.

Table 17. Contributions of Selected factors to Differences in Saving Rates Between East/Southeast Asia and Selected Regions, 1970-92. (percent)

	Contribution of each variable to the difference in National Savings Rate relative to East/Southeast Asia		
Factor	**South Asia**	**Sub-Saharan Africa**	**Latin America**
Demography	**-4.1**	**-9.5**	**-2.1**
Young-Age Dependency Ratio	-2.5	-4.8	-2.4
Life Expectancy	-1.6	-4.7	0.3
Government Policies	**-4.0**	**-2.6**	**-4.9**
Central Government Savings (% of GNP)	-2.0	-1.4	-1.8
Government Social Security Expenditure (% of GNP)	-0.3	-0.0	-1.2
Credit to Public Sector (% of GDP)	-1.6	-0.9	-0.9
Threshhold Inflation	-0.0	-0.4	-1.0
Economic Growth			
Growth in per capita income (lagged %)	-0.9	-1.2	-1.2
Finacial Sector Development			
Money Supply (M2, % of GDP)	-1.4	-1.6	-1.5
Difference in:			
Predicted Savings Rate	**-10.4**	**-14.9**	**-9.7**
Actual Savings Rate	**-14.7**	**-16.4**	**-11.1**

Note: The ten economies in our sample from East and Southeast Asia are China, Indonesia, Korea, Malaysia, Papua New Guinea, Philippines, Singapore, Thailand, Hong Kong and Taiwan.

Table 18a. Total Factor Productivity Results: Bosworth, Collins, and Chen (average annual growth rates, percent)

Regions/Period	Output/worker	Contributions of Sources of Growth: Physical Capital	Education	Total Factor Productivity
Korea				
1960-1970	5.1	3.5	0.9	0.6
1970-1980	5.9	4.5	0.5	0.8
1980-1986	6.2	2.9	0.7	2.5
1986-1992	6.6	3.9	0.7	1.9
Singapore				
1960-1970	5.60	5.20	0.30	0.10
1970-1980	4.30	3.90	0.00	0.40
1980-1986	3.60	3.70	0.70	-0.80
1986-1992	7.40	2.60	0.60	4.00
Taiwan				
1960-1970	6.50	4.50	0.50	1.40
1970-1980	6.10	4.10	0.70	1.10
1980-1986	4.50	2.10	0.50	1.80
1986-1992	5.90	2.80	0.50	2.50
Average				
1960-1970	5.73	4.40	0.57	0.70
1970-1980	5.43	4.17	0.40	0.77
1980-1986	4.77	2.90	0.63	1.17
1986-1992	6.63	3.10	0.60	2.80
South East Asia				
1960-1970	3.25	2.18	0.35	0.70
1970-1980	4.03	2.73	0.33	0.90
1980-1986	1.05	2.30	0.60	-1.83
1986-1992	4.58	2.00	0.58	1.90
South Asia				
1960-1970	2.56	1.64	0.30	0.62
1970-1980	1.46	0.88	0.22	0.36
1980-1986	2.78	1.28	0.30	1.18
1986-1992	1.52	0.78	0.30	0.40
China				
1960-1970	1.70	0.00	0.40	1.30
1970-1980	3.20	1.90	0.50	0.80
1980-1986	7.10	2.50	0.40	4.00
1986-1992	6.20	3.10	0.50	2.50
Asia				
1960-1970	3.44	2.32	0.38	0.72
1970-1980	3.30	2.28	0.32	0.65
1980-1986	3.04	2.06	0.48	0.47
1986-1992	4.00	1.87	0.47	1.58

Table 18b. Total Factor Productivity Results: Young (average annual growth rates, percent)

Region/Period	Output	Weighted Capital	Weighted Labor	Total Factor Productivity
Hong Kong				
1961-1966	10.9	5.8	1.6	3.5
1966-1971	6.5	2.7	1.6	2.3
1971-1976	8.1	2.7	1.6	3.8
1976-1981	9.9	3.8	3.9	2.2
1981-1986	5.8	3.2	1.6	1.0
1986-1991	6.3	2.6	1.3	2.4
1966-1991	7.3	3.0	2.0	2.3
Singapore				
Economy:				
1966-1970	12.5	7.1	1.5	3.9
1970-1980	8.5	7.4	2.7	-1.6
1980-1990	6.8	4.4	3.1	-0.7
1966-1990	8.5	6.1	2.7	-0.3
Manufacturing				
1970-1990	8.5	6.7	2.8	-1.0
South Korea				
Economy- excluding agriculture				
1960-1966	7.7	2.3	4.8	0.6
1966-1970	14.4	6.4	6.9	1.0
1970-1975	9.6	4.2	3.5	1.8
1975-1980	9.4	5.8	3.5	0.1
1980-1985	8.7	3.0	3.3	2.4
1985-1990	10.9	3.1	5.1	2.7
1966-1990	10.4	4.4	4.4	1.7
Manufacturing				
1966-1990	14.1	7.4	3.9	2.9
Other Industry				
1966-1990	11.5	5.4	4.2	1.9
Services				
1966-1990	8.8	2.4	4.6	1.8
Taiwan				
Economy- excluding agriculture				
1966-1970	11.3	4.8	3.2	3.4
1970-1980	10.6	4.2	4.9	1.5
1980-1990	8.0	2.5	2.5	3.0
1966-1990	9.6	3.6	3.6	2.4
Manufacturing				
1966-1990	10.8	5.5	3.9	1.4
Other Industry				
1966-1990	8.8	3.9	3.8	1.2
Services				
1966-1990	9.1	2.3	3.4	3.4

Source: Young (1995)

Table 18c. Total Factor Productivity Results: Rao & Lee (average annual growth rates, percent)

	Output	Contributions of Sources of Growth		
		Capital	Labour	Total Factor Productivity
Singapore				
Economy-wide				
1966-1973	12.7	9.0	2.4	1.3
1976-1984	8.5	5.6	2.3	0.6
1987-1994	8.6	3.6	2.4	2.6
Manufacturing				
1976-1984	7.7	5.8	2.3	-0.4
1987-1994	10.0	4.5	2.3	3.2
Services				
1976-1984	8.7	5.5	2.3	0.9
1987-1994	8.1	3.4	2.5	2.2

Source: Rao & Lee, 1995

Table 18d. Total Factor Productivity Results : Kim and Lau

(average annual growth rates, percent)

		Contributions of Sources of Growth		
	Output	**Capital**	**Labor**	**Technical Progress**
I. Meta-Production Function				
Hong Kong	7.8	3.7	1.3	2.7
Singapore	8.9	4.9	2.0	2.0
South Korea	8.6	5.8	1.6	1.2
Taiwan	8.7	6.3	1.1	1.3
Average of five* industrial countries	3.8	1.4	0.1	2.4
II. Conventional TFP Approach				
Hong Kong	7.8	4.3	1.4	2.1
Singapore	8.9	6.9	1.6	0.4
South Korea	8.6	7.9	1.2	-0.5
Taiwan	8.7	6.8	1.1	0.8
Average of five* industrial countries	3.8	2.3	0.2	1.3

* Five Industrial Countries are France, West Germany, Japan, United Kingdom and United States

Source: Kim & Lau, 1994

Table 19. Growth Prospects for Asian Economies, 1995-2025

	GDP per capita relative to US			Projections, 1995-2025					
				Baseline (1995 Policies) [a]		Improved Policy Standard [b]		Inward Policies [c]	
	1965	1995[d]	Per capita growth, 1965-1995	GDP per capita relative to US in 2025	Per capita growth rate, 1995-2025	GDP per capita relative to US in 2025	Per capita growth rate, 1995-2025	GDP per capita relative to US in 2025	Per capita growth rate, 1995-2025
Four Tigers	***17.3***	***72.2***	***6.6***	***98.5***	***2.8***	***98.5***	***2.8***	***60.9***	***1.2***
Hong Kong	30.1	98.4	5.6	116.5	2.1	116.5	2.1	72.1	0.5
Korea	9.0	48.8	7.2	82.6	3.5	82.6	3.5	52.5	2.0
Singapore	15.9	85.2	7.2	107.0	2.5	107.0	2.5	66.2	0.9
Taipei,China	14.2	56.2	6.2	88.0	3.1	88.0	3.1	52.8	1.4
PRC	***3.2***	***10.8***	***5.6***	***38.2***	***6.0***	***46.4***	***6.6***	***23.7***	***4.4***
Southeast Asia	***10.0***	***21.2***	***3.9***	***45.7***	***4.5***	***52.8***	**5.1**	***28.0***	***2.9***
Indonesia	5.2	13.1	4.7	35.8	5.0	42.5	5.6	22.9	3.5
Malaysia	14.3	36.8	4.8	71.2	3.9	76.4	4.1	42.6	2.2
Philippines	10.7	9.4	1.2	28.5	5.3	41.3	6.5	17.7	3.7
Thailand	9.7	25.6	4.8	47.4	3.8	50.8	4.0	28.6	2.1
South Asia	***8.5***	***9.2***	***1.9***	***21.3***	***4.4***	***44.1***	***6.9***	***15.0***	***3.3***
Bangladesh	9.9	8.5	1.6	17.2	3.9	48.7	7.3	14.3	3.3
India	6.5	7.8	2.2	24.4	5.5	36.8	6.9	15.1	3.9
Pakistan	7.7	7.7	1.6	18.1	4.4	52.9	7.9	15.1	3.8
Sri Lanka	10.1	12.6	2.3	25.3	3.9	37.8	5.3	15.6	2.3
Papua New Guinea	14.5	10.0	0.4	10.1	1.5	26.7	4.7	8.4	0.9

Notes: Per capita GDP levels and growth rates are based on 1985 international (purchasing power parity) prices, from the Penn World Tables, version 5.6 except China, which is based on Gang, et. al 1996.

(a) Baseline projection assumes that all countries maintain the policies recorded in 1995.

(b) Improved Standard projection assumes that all countries adopt the same policies as the Four Tigers' average in 1995.

(c) Inward policies assume openness changes from 1.0 to 0.5, and central government savings/GNP declines 5 percentage points.

(d) 1995 per capita GDP levels are based on 1992 values from the The Penn World Tables Mark 5.6, extrapolated forward with growth rates from the IMF (*International Financial Statistics*).